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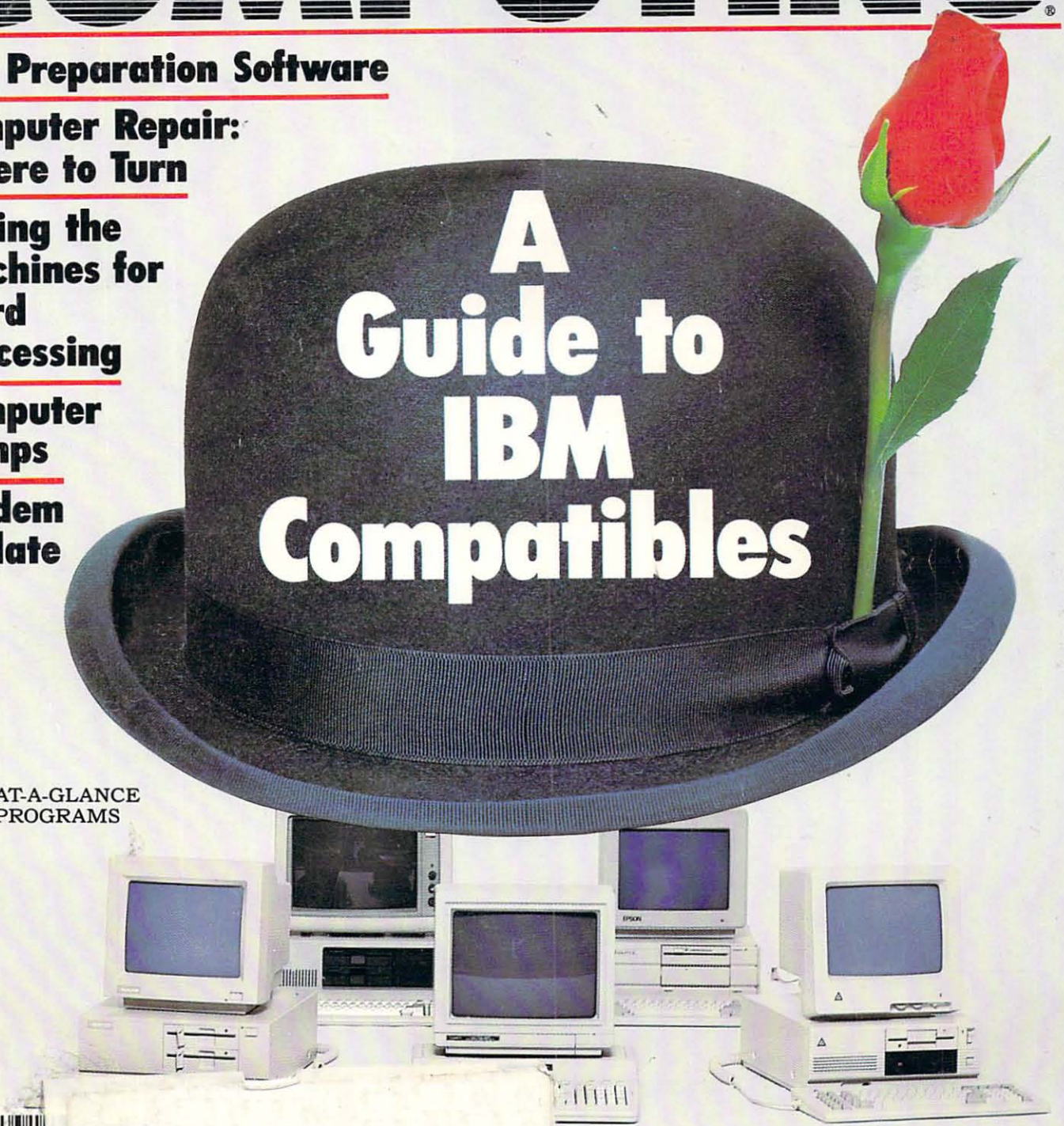

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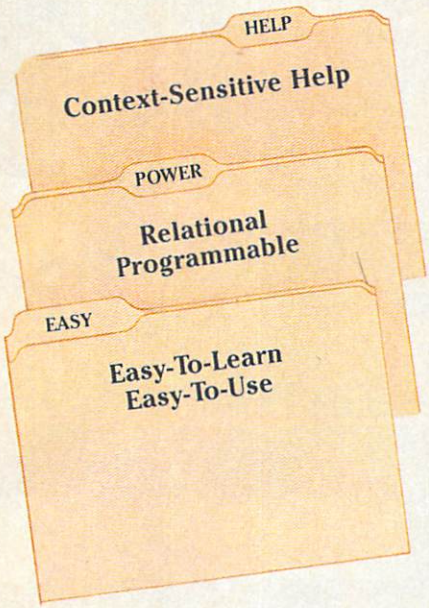

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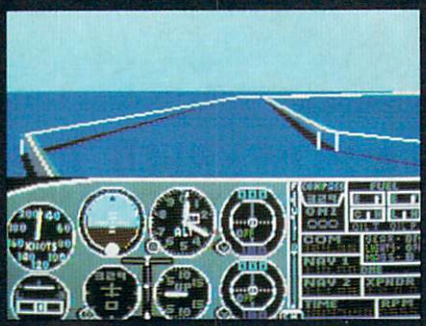

CIRCLE READER SERVICE 50

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MARCH
1987

FAMILY COMPUTING

VOLUME 5
NUMBER 3

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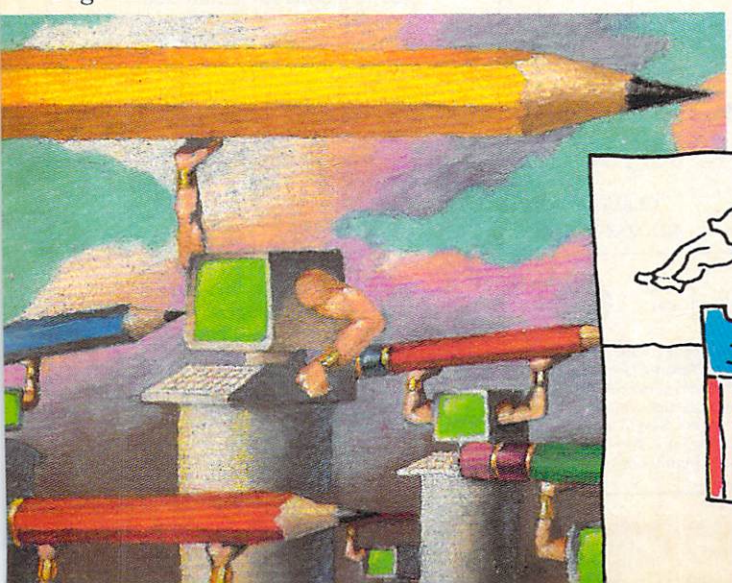

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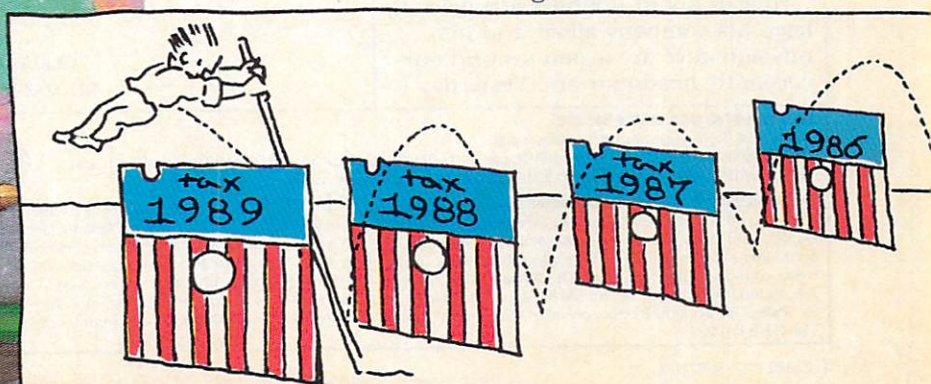


EDITOR'S NOTE

FLORENCE LIDDELL ROBINSON

Yesterday I attended a funeral service for Florence Liddell Robinson, whose affiliation with Scholastic Inc., publishers of FAMILY COMPUTING, began in 1925, when she won first prize in the Literary Article category of the Scholastic Writing Awards. In 1930, having graduated with highest honors from Trinity College in Washington, D.C., but unable to find a job because of the Depression, Florence Liddell turned to that same young company called Scholastic, where there was an opening for a secretary. For several weeks Florence Liddell applied the intelligence that had won her academic honors to learning shorthand and was able to handle the work of her new position by the time her job started.

I knew Florence Liddell as Florence Robinson, wife of Robbie, the founder of Scholastic and mother of Richard, the company's current president, chairman, and chief executive officer. That's right, she married the boss, in 1934, as our company history states, and lived happily ever after, until Robbie died in 1982.

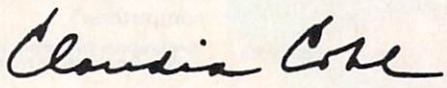
Yesterday, for the first time, I heard about Florence Liddell, the outstanding student, and about Florence Liddell Robinson, the strong, warm, and wise wife, mother of five children, relative, neighbor, community worker, friend, and devout believer. But I also learned some other things.

Stories about Robbie's struggles to keep his company afloat and his mission alive are legion around our corporate headquarters. Yesterday I heard a different twist to the stories.

Herb McCracken, who was with Robbie from just about the beginning of Scholastic, said to me after the service, "It was Florence, and it was my first wife, Helen, who kept Scholastic going. Without their support, we could never have kept the company alive."

And Dick Robinson made me aware of how his mother's sense of responsibility to the company and interest in its activities extended beyond Robbie's death. Florence Robinson, at the age of 75, became aware of Scholastic's involvement with computer-related products and enrolled in a 14-week-long, adult computer-literacy course at the high school where she'd served on the School Board for many years. That's why she was always so interested in FAMILY COMPUTING whenever we met in recent times.

After listening to friends and family members reminisce about Florence Robinson and witnessing their sorrow and their own strength, I came away with a sense of her power, humor, and resourcefulness. And I came away, too, with a feeling of debt, to a woman whose life demonstrated all we can do for the people we touch.



CLAUDIA COHL
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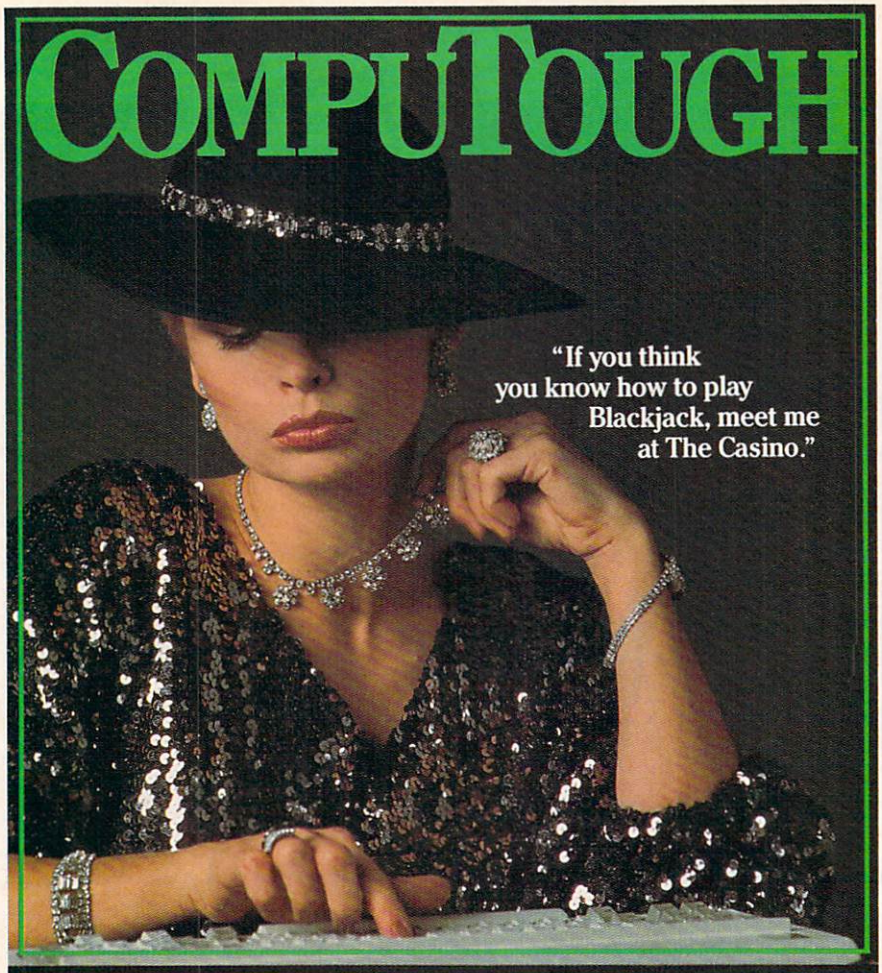

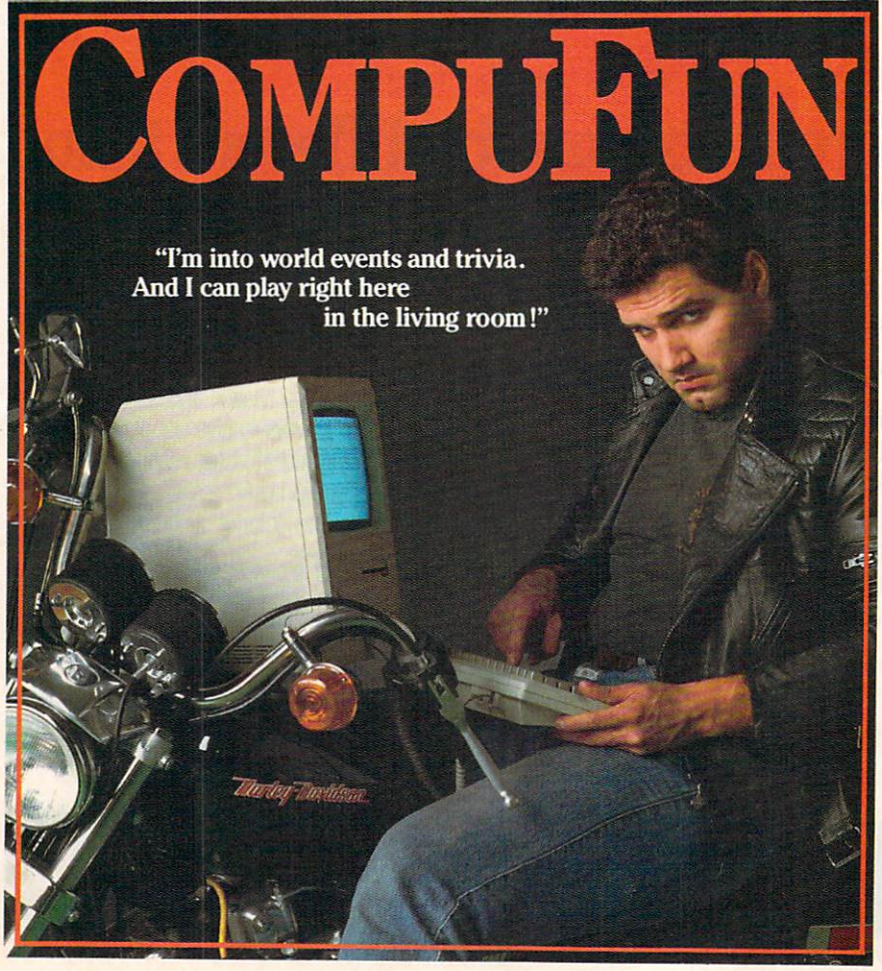

LETTERS

DAUGHTERS *DO* COMPUTE!

I receive your magazine every month, and my family truly enjoys it. But I was upset by "How To Get a Reluctant Daughter Interested in Computers" in the December issue.

My daughter Jessica is 13 years old; she and her friends (girls) have to be ordered away from their computer because they spend all their time playing games such as *Sargon III*, *Lords of Conquest*, *Starflight*, *Flight Simulator*, etc.

Jessica has as great an interest in computers as I do, and I'm a programmer. She can even write her own programs in BASIC and LOGO. Obviously, my wife has not set a negative example for Jessica by not learning about computers herself.

We feel that the article did not provide much information about *how* to get a reluctant daughter interested in computers. Our experience has shown that children who are shown how computers work and are allowed to use them will soon get hooked on the magic of computers.

PHILIP CARISTO
Jemez Springs, New Mexico

WHY PICK THE IIGS?

I was rather surprised to see your pick for the Best Computer of 1986 in the December issue.

First, the Apple IIGS is a new contender in the market. Few people have ever seen one, and certainly not enough people have bought and used the machine to justify the distinction you placed upon it.

Second, the IIGS is simply not the best computer of 1986! Compare it to the Atari 520ST: The two have equal pricing and screen resolution, mice, and Mac-style user interfaces, but the ST is more than five times as fast, and comes with a color monitor included in the price. Apple IIGS buyers must contend with paying another $499 for theirs. The ST comes with 512K built in, while the GS has only 256K.

I hope this letter clears a bit of the media-induced haze clouding the real Apple IIGS. I otherwise enjoy your magazine very much and look forward to my next issue.

JACOB DONHAM
San Rafael, California

EDITOR'S NOTE: *The Apple IIGS was one of the few new models introduced in 1986 (the Atari 520ST,*

Amiga 1000, and Leading Edge Model D were introduced in 1985). Besides running new packages that take advantage of its advanced color and sound, it runs virtually all existing Apple II software. We agree with many readers that the price of a complete system is high, but the price should drop as more computers are manufactured and sold.

Z-171 PORTABLE

In the December 1986 "Buyer's Guide to Portable Computers," an item about the Zenith Z-171 states that "its keyboard has no numeric keypad (maybe the I.R.S. is getting lax!)."

I am an I.R.S. agent currently instructing other agents in the use of the Z-171, and I suggest you take another look at the keyboard. The Z-171 most certainly does have a numeric keypad.

O'NEAL O. GLASGOW
Johnson City, Tennessee

HOW ABOUT THESE IBM PC-COMPATIBLES?

In your November 1986 "Buyer's Guide to Computers," you mainly covered the 16-bit computers. There was some very good information in this article, but there is so much yet to be covered.

I am actively seeking information, since I plan to purchase a computer for our home. I am leaning toward IBM compatibles and have come across several unfamiliar names, such as Compaq, Corona, Cordata, Franklin 8000 (sold at Sears), and many others. Is there somewhere to get information on these and other systems!

DOUGLAS W. KEENE
Collinsville, Illinois

EDITOR'S NOTE: *See the "Buyer's Guide to IBM PC-Compatible Computers" in this issue, and watch the IBM/MS-DOS column in the Machine Specifics department for continuing developments in the IBM PC and compatibles market.*

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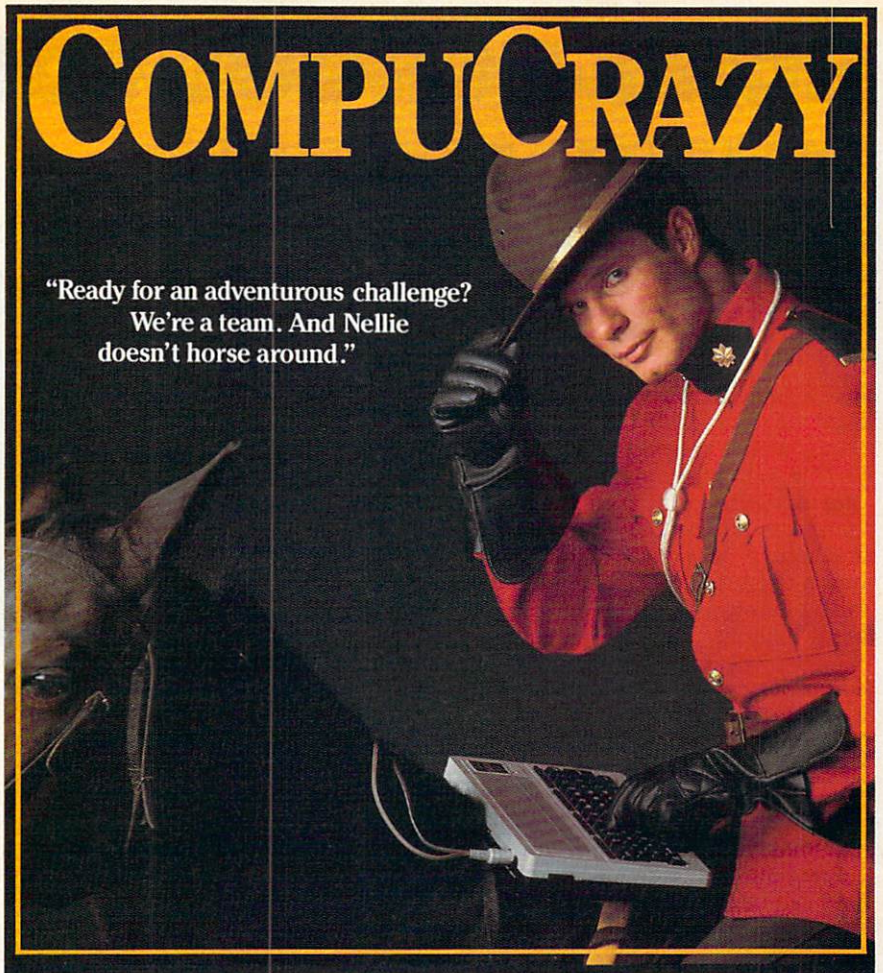

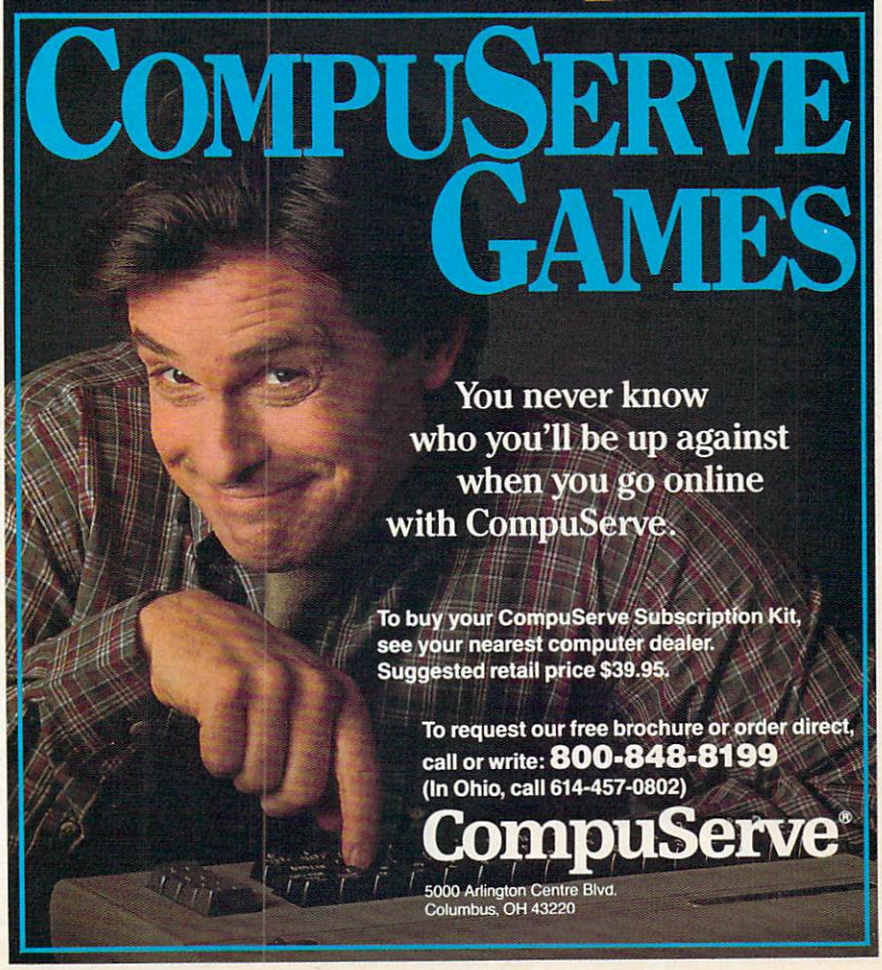

CIRCLE READER SERVICE 14

HOME-SCHOOL CONNECTION

GATHER 'ROUND THE CAMPFIRE

Send Your Kids to Computer Camp for Fun and Learning

BY STEPHANIE ESTERS

Are summers away at camp standard for your kids? Or is it just a thought that crops up in the back of your mind? While talk around the dinner table is still filled with "school-is-such-a-pain" complaints and tales of after-school activities, now's the time to start talking about (and planning for) the summer break.

Consider a camp with a twist—a computer camp. Not sure if your kids would go for the idea? Plenty have enjoyed the experience so much that they want to go *back* again and again. Six-year-old Robert Hsu and 11-year-old Ann Mitsakos were day campers last summer at Computer-Ed in their hometown of Weston, Massachusetts. "I really liked it," says Ann. "I want to go again this summer."

Her mother, Tilda, is also pleased with Ann's experience. "She was very enthusiastic," says Tilda. "I was delighted that she was so motivated by everything."

And Frank Hsu says that even though his son was one of Computer-Ed's youngest campers ever, Robert overcame his shyness, took full advantage of the camp, and enjoyed himself.

Another father, Jerry Crittenden Sr., of San Antonio, Texas, first encouraged his kids to take advantage of the computer opportunities at Kickapoo Aspects Microcomputer Proficiency (K.A.M.P.) back in 1983.

His daughter Sherri, 16, had no computer experience when she took her dad up on his offer four years ago, but she says she discovered a strong desire to learn more about computers. Both she and her brother Jerry, 14, have been going to the camp ever since.

A high-school sophomore, Sherri was surprised by the various activities at K.A.M.P. in San Antonio. "It wasn't just all computers. There were different activities, and you even had free time." Archery, canoeing, horseback riding, and riflery are some of the activities offered.

STEPHANIE ESTERS *is* FAMILY COMPUTING*'s researcher.*

WHY A COMPUTER CAMP?

Computer camps will teach your children—whether they're novices or hackers—more about computers, while providing as much stimulation, entertainment, and challenge as any other camp.

Whether you send your children to learn how to use a computer, brush up on their computer skills, or get more individualized and challenging instruction, a computer-camp experience rivals that of any other camp. With extracurricular activities that include archery, arts and crafts, drama and theater instruction, tennis, swimming, volleyball, water-skiing, and a host of other land and water sports, your kid might seriously wonder, "Am I at a computer camp?" But the mastery of basic computerese and your child's newly developed confidence with computers will be proof enough.

Ann Mitsakos's mother thinks that this computer know-how gives her child an edge over her peers. "It seems to be a skill that is going to be imperative. I've seen how important basic computer literacy is."

Mike Benton, author of *The Complete Guide to Computer Camps and Workshops*, agrees. Benton says the camps were initially established in response to parents' concerns that the school systems were not adequately preparing their youngsters for the future. "The parents perceived that their children were not receiving enough [computer] education in the school system," he says.

COMPUTER-OPTION CAMPS

Author Mike Benton believes that parents' anxieties have lessened somewhat over the past few years, since the introduction of more computer courses into the school curriculum. The multifaceted computer-camping experiences, he believes, are one indication of how sophisticated children, parents, and educators have become with computers.

Since the introduction of computer courses into most school curricula within recent years, many parents are sending their children to a traditional camp with a computer option as opposed to a computer-intensive camp, according to Benton. However, he adds, "If you are trying to have a computer-camp experience, that's still possible." (NOTE: *See the accompanying list and description of computer camps.*)

WHAT PARENTS SHOULD KNOW

If you're considering a computer camp, what do you need to know? Here are some factors you should discuss with camp administrators: the minimal age and experience re-

RESOURCES

The following publications can answer any further questions you may have about computer camps.

Benton's *The Complete Guide to Computer Camps and Workshops* ($10.95; The Bobbs-Merrill Publishing Company, Inc.; [800] 257-8247) is an excellent first source. The book instructs parents on the types of questions to ask, what to look for and expect from a computer camp, and discusses a typical day at camp. A state-by-state listing of camps is provided, complete with costs, minimum ages, experience levels accommodated, and brief descriptions.

The American Camping Association publishes an annual *Parents' Guide to Accredited Camps* ($8.95). Although not specifically a computer camp reference guide, many of the camps listed offer computer training as part of their general program of activities or as a specialized option. This book is available by writing ACA, Publications, Bradford Woods, 5000 State Road 67 North, Martinsville, Indiana 46151 or call (800) 428-CAMP or (317) 342-8456 in Indiana.

ILLUSTRATION BY STEVE PARTON

quirements for the campers, the ratio of children to computers and staff members, and the qualifications of the staff.

Most of the camps provide instruction based on the child's level of expertise—whether he or she is starting out with absolutely no experience (beginner), some experience (intermediate), or as an advanced student. At K.A.M.P., Director Kathy Musgrave says that "most of the kids have some experience," but adds that no one will be outpaced because each child is individually interviewed and placed with children who have similar levels of experience.

If you're thinking of sending a youngster who has never spent time away from home alone, be sure he or she is emotionally capable of adjusting. And, if the camp is not too far from home, consider enrolling your child at a day camp.

Also, make sure your child will have adequate access to the computer and the staff members. Benton advises no more than "two campers per computer," adding that a "one-to-one ratio" is ideal. As for instructors, make sure that your child will get the attention and guidance he or she needs. Benton adds that parents should check "the qualifications of the person who's running the camp rather than the instructors themselves." Because of their proximity in age and academic interest, college computer-science majors "are some of the best, and they have a better rapport and understanding of what the kids want to do," says Benton.

As for camp accreditation itself, there is no one national organization that examines and approves computer camps. The American Camping Association (ACA) provides accreditation for the camp overall, not just one aspect of it.

Parents should make a list of all their concerns as they choose camps. Only settle on the camp that best answers your questions and puts you most at ease. Remember, it's your money and your child! FC

WHERE TO CAMP OUT WITH COMPUTERS

If you and your children think that gathering around the computer is just as important as singing around the campfire, you'll want to take a look at these camps. While they're all computer intensive, they offer many other camp activities as well.

Computer Camp	Sessions	Costs	Ages	Computers	Languages
Blue Star Camp P.O. Box 1029 Kanuga Road Hendersonville, NC 28739 (704) 692-3591 Winter Address: 3595 Sheridan Street Hollywood, FL 33021 (305) 963-4494 Director: Rodger Popkin	two one-week sessions	$375 per session	6-17	Apple IIe	BASIC, Logo, Pascal
Computer-Ed Inc. 99 School Street Weston, MA 02193 President: Marilyn Pardus	two-, four-, six-, or eight-week sessions	$925 for two weeks	6-15	Adam, Apple, Commodore, IBM, Franklin	BASIC, Logo, Pascal
Computer Camp YMCA Point Bonita Building 981 Fort Berry Sausalito, CA 94965 (415) 331-9622 Director: Doug Wood	one one-week session	$239 for YMCA members; $265 for non-members	8-13	Apple IIe, Macintosh	BASIC, Logo, Pascal
Kickapoo Aspects Microcomputer Proficiency Camp (K.A.M.P) Computer Aspects P.O. Box 47639 San Antonio, TX 78265 (512) 657-7981 Director: Kathy Musgrave	one one-week session	$475	9-15	Apple IIe, IBM, Macintosh	BASIC
Marist College Computer Camp Poughkeepsie, NY 12601 (914) 471-3240, x345 Director: Dr. Lawrence W. Menapace	one two-week session	$925 for each session	9-17	Apple IIe, IBM	BASIC, Logo, Pascal
Midwest Computer Camp 9392 Lafayette Road Indianapolis, IN 46278 (317) 297-2700 Director: Lynn Crawford	five one-week sessions	$400 first week, $350 each additional week	8-18	Apple, Atari, Commodore, IBM, Texas Instruments	BASIC, FORTRAN, Logo

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MAKING YOUR WORK LOOK GOOD
It's the Difference Between a Smart Suit and a Threadbare Tweed

BY CHARLES H. GAJEWAY

ILLUSTRATION BY TOM CUSHWA

When a professional is paid to render services, it is understood that the job in question will be performed to a high standard of quality. And a good part of a client's perception of quality lies in the look and feel of the final presentation. A well-researched report, a painstakingly revised article, or a creative design effort can lose much of its impact—and apparent value—if it is poorly presented or indifferently packaged.

A computer can be an invaluable asset to your professional activities, allowing you to work faster and more accurately. But while using a computer will help you produce quality work, it is not enough to guarantee a quality presentation. That requires extra planning and effort.

Let me pass on a collection of tips, gadgets, and techniques that I use to put a professional gloss on even the most casual effort. After all, you never know what—or who—might send a juicy assignment your way!

MOTTO: BE PREPARED

The first step in producing quality work is to make sure that you are always ready. You can't perform effectively if you have to dash out and purchase supplies or learn software every time you do a job. Invest in an inventory of disks, paper, ribbons, envelopes, labels, stamps, or whatever you will routinely require to produce your work. Buy and learn all the software you will need, and keep it scrupulously updated. Knowing how to use an obscure feature can save you hours of frustration.

And don't skimp on supplies. Your client deserves a top-quality product, and expects it! Trying to shave expenses on materials is downright foolish. Your working drafts can be printed on both sides of a tissue with a five-year-old ribbon, but final copy *must* look and feel as sharp and fresh as possible.

I always use 20 lb., 25 percent rag bond paper with microperforated edges to produce documents for a client. This "computer stationery," as it's sometimes called, gives my work a crisp, durable look and feel that can't be beat. It costs about $40 per 1,000 sheets, nearly twice the cost of standard, continous-form paper, but since it's used only for final production, I don't use much.

You can find such paper from Boise Cascade, Rediform, and others. It's available in a variety of colors and finishes from computer dealers and office supply stores, although the most economical source is generally a mail-order catalog vendor like Inmac ([408] 727-1970) or Pryor ([800] 558-6866).

BASIC HARDWARE

Anyone even considering doing professional work on a computer system at home probably has a monitor that will crisply display 80 columns or more, at least one disk drive, and high performance software to enable them to perform complex work efficiently. It can be tempting, however, to make-do with an old or low-performance printer, a false economy in this day of plummeting printer prices. A good printing system is what links your

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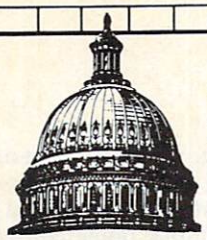
CHARLES H. GAJEWAY, *a contributing editor for* FAMILY COMPUTING, *wrote "Organize Your Collections" in the January issue.*



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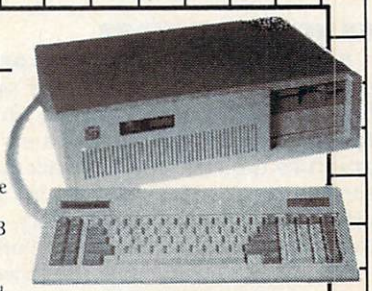

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work with your client's eyes, and is just as important as your choice of computer and software.

A fast (120-200 cps) dot-matrix printer capable of crisp near-letter-quality (NLQ) text and graphics is a blessing for most users. You can find printers from Epson, Gemini, Brother and others for less than $300. They are extremely versatile and produce results that are adequate for all but the most demanding word-processing applications. A wide-carriage model (with a 12- or 15-inch carriage) offers maximum versatility, particularly if you want to print out large quantities of numeric data.

Despite the greatly improved quality of dot-matrix printers, notably the new 24-pin types, there is still no substitute for the crisp clarity of a daisy-wheel printer. While office-quality units are still expensive, generally over $1,000, there is a growing number of surprisingly inexpensive units that print beautifully, if somewhat slowly (12-20 cps). Silver Reed, Brother, Dynax, and others sell such units.

I rely on my workhorse dot-matrix for speedy drafts and graphics, but almost every page of text that leaves my office is printed on the daisy-wheel. People who make charts and graphs might consider a color printer instead.

If having two printers seems extravagant or wasteful, consider this: Such a combination can currently be purchased for little more than an Epson MX-80 cost just a couple of years ago (about $700). And, it can make your documents look as if they came from a well-equipped corporate office. An efficient and versatile printing system is an investment in your professional image and your clients' satisfaction that will pay itself back many times over.

FANCY HARDWARE

Some computer peripherals are simply too expensive for many professionals who work at home. But this doesn't mean you can't use graphics tablets, video digitizers, laser printers, multi-pen plotters, and other high speed or heavy-duty items to add pizzazz to your work.

The places and people that own such equipment are frequently willing to share or rent it during times when it would otherwise sit idle. Users' groups, schools, libraries, dealers, and employers are all good sources of "power gadgets" if you have a relatively small job that you are willing to do "after hours," or if you come up with a modest fee. Many Apple dealers, for instance, rent time on the Apple LaserWriter printer.

Ask around, take the time to prepare your job so that it can be run off quickly, and provide your own materials. And be willing to make your own equipment and expertise available to your lenders; a friendly, sharing attitude makes it easier for people to open their resources to you.

DETAILS, DETAILS

Pay attention to the little things. For my business correspondence, I have a local "instant press" produce letterhead and matching envelopes on rag bond stock at a surprisingly modest cost. I use transparent mailing labels that are virtually invisible on any type of paper, eliminating the "mass-mailing look" from computer-generated correspondence. These labels are available from Avery Label Business Systems Division ([201] 545-6300) and Dennison Manufacturing Co. ([617] 890-6350).

Drafts and reports alike get a title page, are bound in clear report covers with slide-on spines, and mailed in heavy 9" x 12" envelopes. All this effort costs very little (perhaps $5 on a large report), but adds immeasurably to the look and feel of your work in the client's hands.

When I use a dot-matrix printer to produce final copy, I put in a fresh ribbon. After the job is done, I remove the ribbon and put it in a plastic bag to keep it from drying out. Generally speaking, a new ribbon will produce 30-40 pages of top-quality output, at which point it becomes a "working copy" ribbon, suitable for drafts and informal family use.

For daisy-wheel printers, I buy single-use carbon film ribbons to get the best quality. Since daisy-wheels tend to be slow and the ribbons get used up quickly, I print draft work on a dot-matrix unit, reserving the "good stuff" only to produce the end product.

THE WORK ITSELF

While top-notch materials and equipment help make your work look its best, the presentation must be designed with care and concern for the client. Writing should be clear and simple, polished and revised so that your logic and conclusions seem natural and inevitable. Numbers should be double- and triple-checked for input and computational accuracy. Sources should be noted, unfamiliar terms defined, and findings summarized cogently.

Reports and proposals look better and read easier when there is plenty of "white space"; densely packed text looks forbidding and leads the reader to skim too lightly and miss important points. Use at least one-inch margins on the left, right, top and bottom. Try to keep your sentences short, and use bullets to separate ideas.

Graphs convey relationships and trends more clearly than numbers and are an effective way of breaking up large blocks of text. I use boldface for headings, underline for minor points, and italics for major points. But don't overdo any of this; too much bold or italic type weakens the impact.

Practice using your word processor and your printer's features to create attractive page designs and emphasize the contents of your presentation. And don't be afraid to take drastic steps to produce exactly the look you want; use scissors, paste, and a ruler to create a perfect page, then take it to a local copy service to weld your patchwork into a seamless original. You may even want to have special documents typeset by an "instant printing" service to get a super-polished appearance. I'll try just about anything to get a product to look exactly the way I would want to receive it.

QUALITY IS JOB NUMBER 1

Quality and pride in performance are what professionalism is all about. And the more that you can make your work fill your clients' expectations, the more they will appreciate it. They may not know exactly why your work stands out in their mind, but it will. Whether you are a lawyer, an accountant, an engineer, or an information worker trying to go the extra mile, the better your work looks, reads, and feels, the more impact it will have on your client. And, ultimately, the better off you will be. FC

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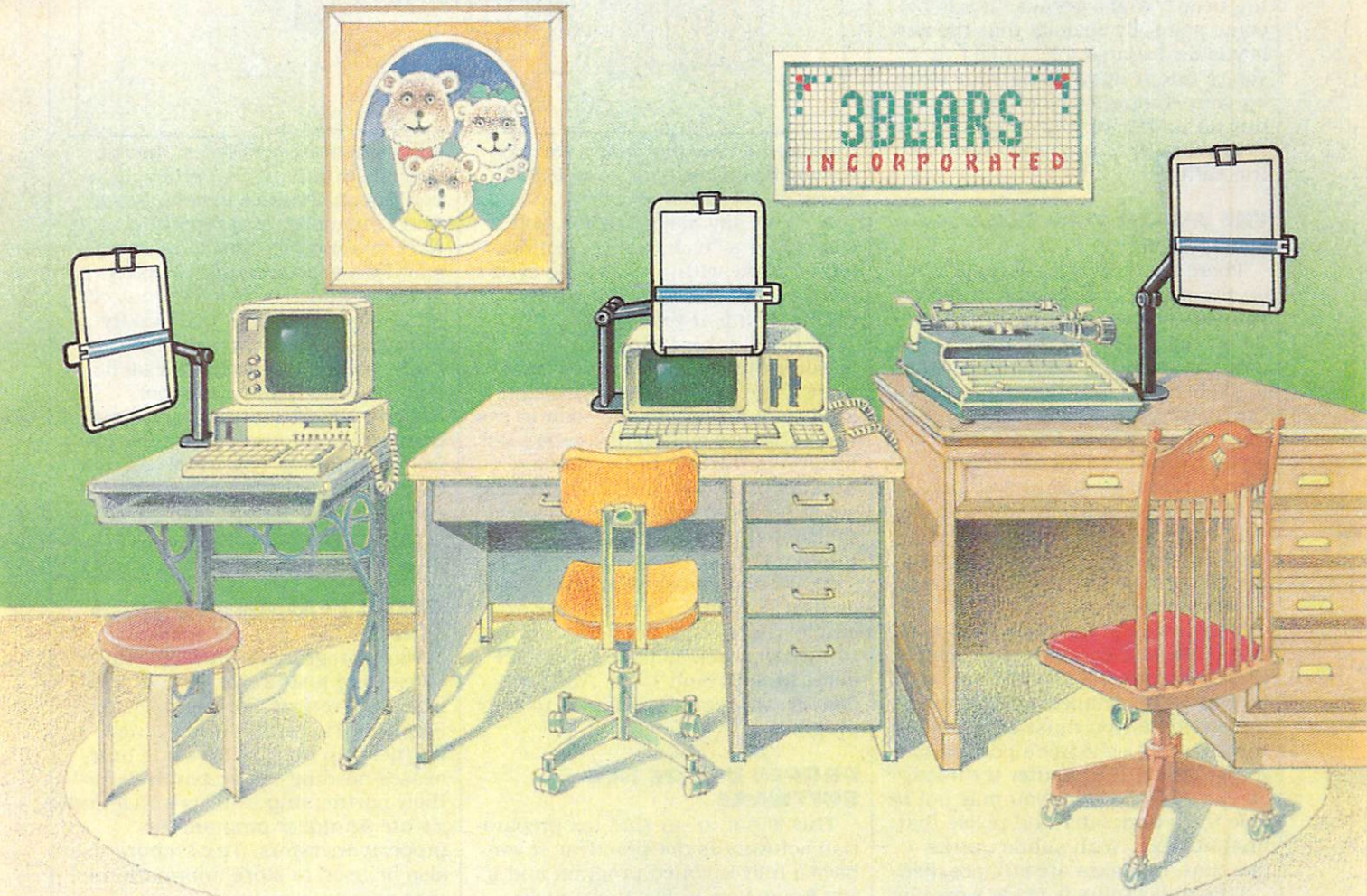

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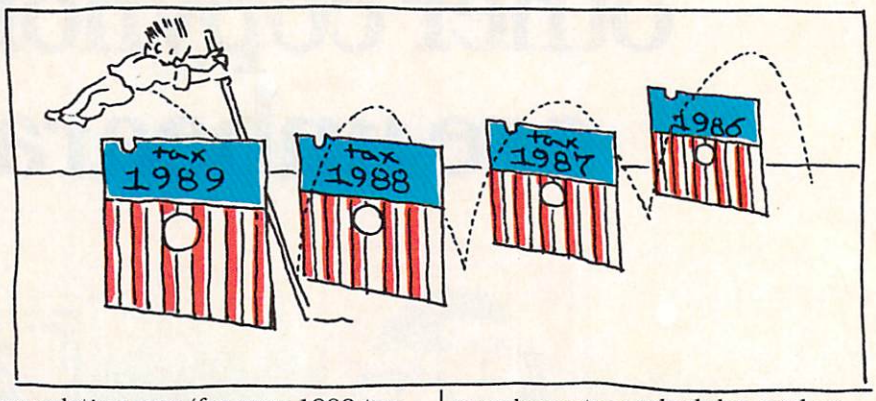
PERSONAL FINANCE

TAX SOFTWARE: A QUESTION OF TIMING

BY MICHAEL C. THOMSETT

Congress meets tomorrow morning. Let us all pray to the Lord to give us strength to bear that which is about to be inflicted upon us.

—WILL ROGERS



Have you noticed lately how the term "tax simplification" is no longer being used? That's because it has become painfully obvious that the new law is far from simple. In fact, if you're intent upon doing your taxes on your computer, be prepared to buy an update of your program disk next year—and, probably, every year thereafter.

THE AUTOMATED TAX PROBLEM

There are a number of programs on the market for the preparation of your tax return, and the prices aren't that bad. But the less you pay, the more inflexible the program is likely to be. Your dilemma with inexpensive programs is twofold: the more complex your tax return, the greater your need for automated help (and the greater probability that inflexible software won't do the job). And the simpler your return, the less you need automation (but the greater the likelihood a given program will work).

Many small programs have proven to be inflexible in one way or another. For example, if you have income that must be detailed on a supporting schedule, you must enter it through that schedule's portion on the program. If you enter it directly on the 1040 portion, you may not be able to go back later and revise that final number. With subtle quirks like that, mistakes are still possible.

This inflexibility is made worse by the sweeping changes in the Tax Reform Act of 1986. Now that our lives are complicated by "simplification," you might be better off to wait until the dust settles before buying a program. And if you are already using tax-preparation software, be sure the revised copy is up-to-date.

Some things to be aware of:

1. The revised tax rules are being phased in over the next three years. So what works for the return you're completing now (for your 1986 taxes) will be obsolete for your 1987, 1988, and 1989 taxes.

2. With any major tax bill, you can expect a "technical corrections" bill to follow within a year. So even if you pay for a revised disk now, it will be wrong at year's end.

3. It will take a while for some features of the new tax rules to be interpreted by the accounting and legal community. It's too soon to say what changes will occur as the I.R.S. interprets the law, but expect a number of decisions during the next six to twelve months that will affect the content of a program you're using today.

4. With any phased-in law, Congress can change its mind. For example, there could be modifications to the tax brackets planned to take effect in 1987 and 1988. Any such change will require revisions to your program.

PROPER USE OF TAX SOFTWARE

This is not to say that tax preparation software is not practical. If you have a fully updated program and if you know how to use it effectively, you can save time and eliminate calculation and recording errors on your personal tax return.

Who should use this technology? Anyone who files more than the standard forms may benefit from automated preparation and in several ways: in recording a lot of information on disk and avoiding having to change numbers that affect several parts of the return; in printing out final forms; and in creating a permanent record of your year's tax records for future reference.

If your return is extremely simple, involving no itemized deductions, no supplementary schedules, and no special situations, you probably don't need software to complete it. And remember, tax preparation software will not help you to a) understand taxes or accounting better; b) avoid an audit; or c) lower your correctly computed legal tax liability (but tax software can lower your I.R.S. bill by pointing out legal deductions you might have overlooked). Unfortunately, many people buy software hoping to achieve one or more of these objectives. Be realistic in evaluating your reasons for even thinking about buying a program before you put down your money.

EXTRA FEATURES TO LOOK FOR

Many programs offer more features than just preparation of this year's tax return. For example, *Tax Preparer* (HowardSoft) has a new Partnership Edition for small businesses needing tax preparation for their partnership returns and a *Real Estate Analyzer* program for property investors. *Tax Preparer* can also be used to store information for next year's tax return.

MacInTax Federal (Softview) offers California state tax software at an additional cost of $45, and this year combines previous personal and business products into a single software package.

PC/Tax Cut (Best Programs) accepts data from another program, *PC/Professional Finance*, and has recently come out with *PC/Personal Investor*, which also downloads to the tax software.

The Tax Advantage (Double Eagle) accepts data from the popular *Home Accountant* personal finance program, which makes keeping

MICHAEL C. THOMSETT *is a financial writer based in Northern California. He has written nine books and contributes to several national magazines.*

ILLUSTRATION BY MONA MARK

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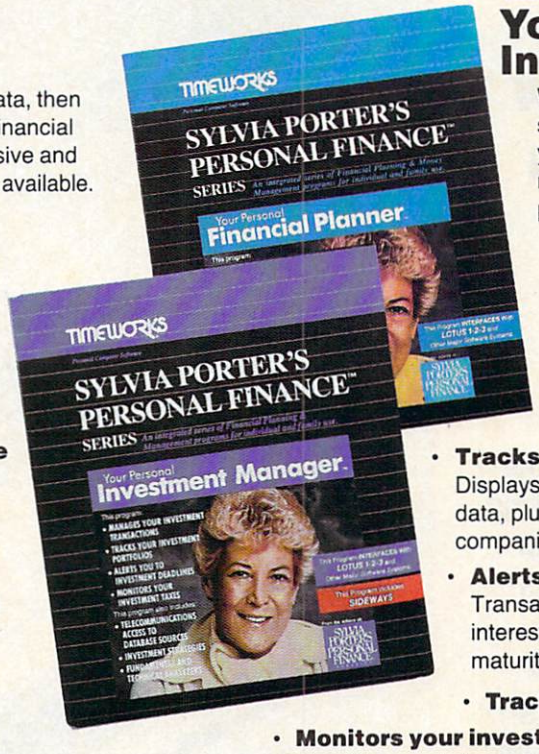

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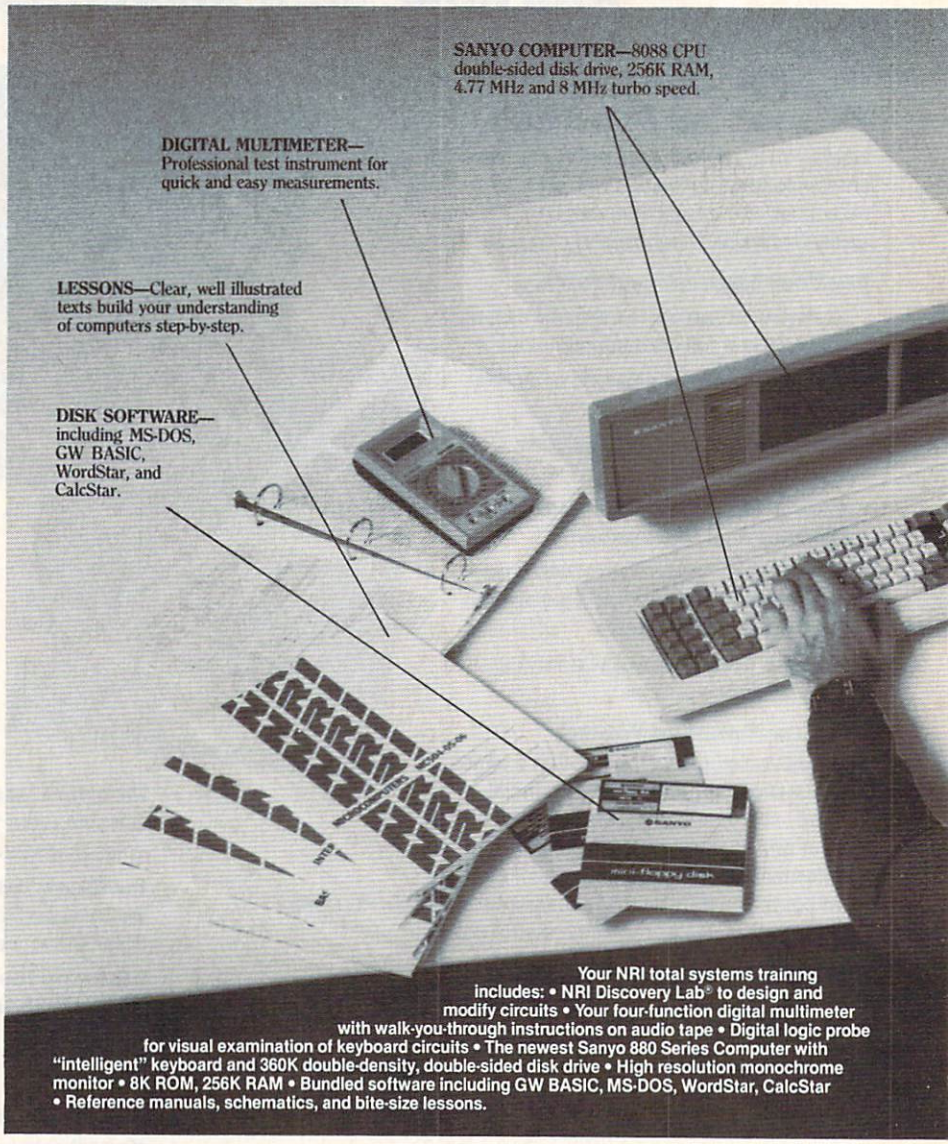

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What appears to be missing in tax programs is a comprehensive documentation procedure for those claiming the expense of a home office. For the thousands of business people working at home, a special section for calculating allowable deductions (such as depreciation, prorated utilities, property taxes, and insurance) would add a great deal to tax-preparation software.

A likely reason for this exclusion is the complex variations that are possible. Qualifying for a home-office deduction is not easy, and there are several different tests for meeting this deduction. (NOTE: *See "Why Pay More? Tax Write-offs For Your Home Business" in the November 1986 issue of* FAMILY COMPUTING.)

GETTING OUTSIDE ADVICE

Even with the exceptions to the rule, the lack of flexibility, and the need for annual updates to your program, you can find good use for tax preparation software. But that doesn't mean you can relax. You may still need outside professional help for advance planning. Many home-based entrepreneurs, for example, will benefit from paying a tax accountant for semiannual reviews. Software, no matter how well it works, does not eliminate the need for knowledgeable outside advice.

So you go to an accountant, review your mid-year status, and make a few planning decisions. At that point, you might come full circle and realize it is more practical to have the accountant do your tax return for you.

This offers three advantages. One, you do not need to be concerned about following directions for a variety of forms and schedules, as well as the software itself. Two, if you are audited, the preparer will accompany you on the dreaded visit to the I.R.S. Three, it eliminates the need to automate your tax return altogether.

Most accounting firms use professional tax software or go to an outside service. These more advanced programs are designed to process tax information for a large number of people. Beyond the budgets and needs of home-based business owners, this software is updated continuously and offers much greater flexibility and sophistication than most of the programs you're likely to consider.

For the cost of having your return done professionally, an accountant might be the best way to go—at least for the next two or three years—unless you want to pay for software updates on a recurring basis.

WHO CAN BENEFIT FROM TAX-PREPARATION SOFTWARE?

In general, you will fit one of three types of taxpayers:

Type A: Your return is rather simple, with a minimum of schedules to file. You probably do not need software to organize your return and are better off filling out the forms by hand.

Type B: You have to file a number of supporting schedules and itemize deductions, and you can use software to organize your records for this year *and* next year.

Type C: Your tax return is complicated, and you need to plan well in advance to minimize your tax liability. The new tax law has made this chore worse than ever. You might benefit from a flexible form of tax-preparation software, but you should also hire an accountant to advise you. In many cases, you will be better off having that accountant prepare your tax return. Spending your money for personalized advice might be a better investment than buying software right now.

A final point: If you use your computer in the operation of a home-based business, you can write off software that has a direct business application. But the Tax Reform Act tightens up on the deductibility of personal and work-at-home expenses. Since these programs are designed primarily to complete your personal return, chances are you won't be able to claim a deduction. FC

TAX-PREPARATION SOFTWARE REVIEW

The programs listed below all provide the most common individual tax forms: Forms 1040 and 2441, and Schedules A, B, C, D, E, G, SE, and W. Additional schedules and forms offered are listed separately.

Title/Publisher/Price	Hardware	Additional Schedules and Forms
F.I.T. South West Computing (505) 589-0999 $60; $40 (update)	CP/M format, IBM PC/PC*jr*	Schedules F, R. Forms 1040A, 2106, 2210, 3468, 4797.
J.K. Lasser's Your Income Tax Simon & Schuster Software (212) 333-2882 $50-$80; $30 (update)	64K Apple, C 64/128, IBM PC/PC*jr*, Macintosh	Schedules F, R, 1. Forms 1040A, 1040EZ, 2106, 2119, 2210, 3903, 4137, 4562, 4684, 4797, 4835, 5329, 6251, 6252.
MacInTax Federal Softview (805) 388-2626 $99; $45 (update)	Macintosh	Schedules F, R, 1. Forms 1040A, 1040EZ, 2106, 2119, 2210, 3468, 3800, 3903, 4562, 4684, 4797, 6251, 6252.
PC/Tax Cut Best Programs (703) 820-9300 $95; $60 (update)	IBM PC	Schedule F. Forms 1040ES, 2106, 2119, 2210, 3468, 3903, 4562, 4797, 4952, 5695.
Swiftax Timeworks, Inc. (312) 948-9200 $50-$80; $25-$40 (update)	Apple, Atari ST, C 64/128, IBM PC/PC*jr*	Schedules F, R. Forms 1040A, 1040EZ, 2106, 4562, 6251.
The Tax Advantage Double Eagle Software Inc. (213) 459-9748 $60; $35 (update)	Apple, Atari, C 64/128, IBM PC/PC*jr*	Forms 2106, 4562, 6251.
Tax Command Professional Practical Programs (414) 272-7227 $50; $25 (update)	64K Apple, C 64/128, IBM PC/PC*jr*	Schedules F, R. Forms 1040ES, 2106, 2119, 3903. (Schedule F and Form 1040ES not available with C 64 version.)
Tax Preparer HowardSoft (619) 454-0121 $250-$295; $75-$95 (update)	64K Apple, IBM PC/PC*jr*	Schedules F, R. Forms 2106, 2119, 2210, 3468, 3800, 3903, 4562, 4797, 6251, 6252.
Tax Return Helper KSOFT, Inc. (312) 961-1250 $33; $22 (update)	C 64/128	Forms 2106, 4562.

NOTE: *Titles listed for the IBM PC/PC*jr *will also run on many compatibles. Check with your dealer or the publisher for complete compatibility information.*

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CIRCLE READER SERVICE 56

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ENTERTAINMENT

HOW GAMES ARE PLAYED: An Informal Survey

BY DAVID HALLERMAN

Back in August of last year, we ran our second survey of gaming and entertainment software. Some eagle-eyed readers may have noticed that we said that we'd publish the results of the survey in the February 1987 issue, but here it is March. The reason for the delay? You overwhelmed us with your responses!

Many thanks to the thousands of readers who took the time to fill out our survey. In an extrapolative poll of one out of five respondents, this is some of what we heard.

Who You Are

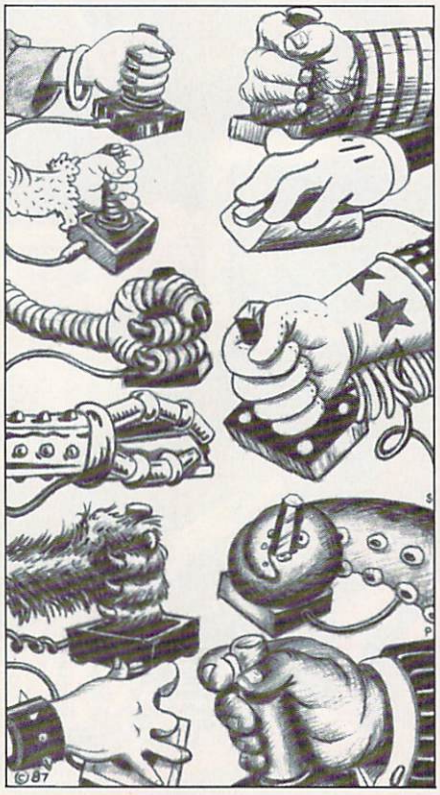
MALE	**77%**
FEMALE	**23%**
LESS THAN 20 YEARS OLD	**41%**
20 YEARS OR OLDER	**58%**
AGE NOT INDICATED	**1%**

The Machines That Play Games

As the numbers show, the top three computers used for gaming by respondents to the survey are the Commodore 64 and 128 duo (28 percent); the Apple II Plus, IIe, and IIc trio (27 percent); and the IBM PC and compatibles (24 percent). Please note that since many respondents told us they have more than one computer, the percentages total more than 100 percent. For example, one reader owns an Apple II Plus, an Atari 800, and an IBM PC, and was therefore counted for all three.

Computer	Ownership
ADAM	**8%**
AMIGA	**2%**
APPLE II SERIES	**27%**
ATARI 800/XL/XE SERIES	**14%**
ATARI ST SERIES	**3%**
C 64 AND C 128	**28%**
IBM PC & COMPATIBLES	**24%**
MACINTOSH	**1%**
TANDY COLOR COMPUTER	**2%**
OTHER	**6%**

DAVID HALLERMAN *edits the software reviews in* FAMILY COMPUTING.



How Long Gamers Have Been Computing

Obviously, from the attached numbers, the majority of FAMILY COMPUTING readers who are game players and who respond to surveys are not newcomers to computers. In fact, a whopping 61 percent have had at least one computer for more than two years.

LESS THAN ONE YEAR	**8%**
ONE TO TWO YEARS	**30%**
TWO TO THREE YEARS	**22%**
THREE TO FOUR YEARS	**17%**
FOUR TO FIVE YEARS	**12%**
MORE THAN FIVE YEARS	**10%**
NOT INDICATED	**1%**

Rules About Playing Games

Only a quarter of the survey replies were from people who follow various rules at home concerning playing games. Some of the rules mentioned were no games until homework is done, no food or drink near the computer, and a limit on time playing games (generally about an hour).

YES, THERE ARE RULES	**25%**
NO, THERE ARE NO RULES	**74%**
NOT INDICATED	**1%**

Who People Play Games With

While the majority of respondents play games by themselves, a large number play with friends as well. And although most games are played one person at a time, almost half the time our respondents play in groups—either adults and kids together or just kids.

YES, I PLAY WITH FRIENDS	**44%**
NO, I PLAY ALONE	**56%**
ONE PERSON AT A TIME	**84%**
ADULTS AND KIDS TOGETHER	**45%**
KIDS IN GROUPS	**42%**
ADULTS WITHOUT KIDS	**32%**

What Computer Games Have Replaced

It's encouraging to see that kids are still doing their homework despite the lure of computer games. However, watching television and playing traditional board games have gone by the wayside for many readers. In addition to the choices below, more than one respondent indicated that he or she "sleeps less" since starting to play computer games.

WATCHING TV	**81%**
PLAYING BOARD GAMES	**53%**
GOING TO MOVIES	**24%**
READING BOOKS/MAGAZINES	**18%**
PLAYING SPORTS	**16%**
LISTENING TO MUSIC	**14%**
SOCIALIZING	**10%**
DOING HOMEWORK	**8%**

How Much Do You Spend?

Not too many surprises from this question. Again, the numbers total more than 100 percent, since a few respondents checked off more than one price range.

LESS THAN $10	**7%**
$10 TO $20	**20%**
$20 TO $35	**49%**
$35 TO $50	**28%**
MORE THAN $50	**2%**
NEVER BUY GAMES	**3%**

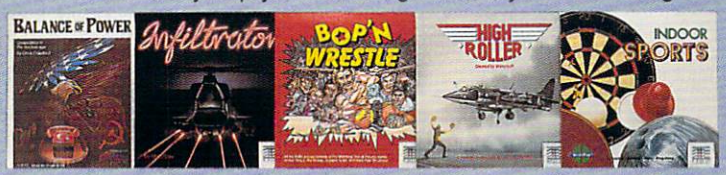
ILLUSTRATION BY STEVE PARTON

STAY HOME AND PLAY.

Why go out when you can have so much fun at home? Just take a gander at the kind of excitement Mindscape has to offer.

With *Indoor Sports*, you can play darts without putting holes in your walls, ice an opponent in air hockey, become a ping-pong pro, and pick up some spares without venturing into an alley.

As a Harrier jump-jet ace in *High Roller*, you'll be doing barrel rolls toward designated targets without waking the neighbors.



Bop'n Wrestle puts you in the ring with 10 of the biggest, baddest bruisers ever to perfect the turnbuckle fly.

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Indoor Sports is available on C64 & C128. *High Roller* is available on C64 & C128 and Atari ST. *Bop'n Wrestle* is available on Apple II family, IBM & compatibles. C64 & C128 and Atari 800. *Infiltrator* is available on Apple II family, IBM & compatibles. C64 & C128 and Atari 800. *Balance of Power* is available on Apple II family, Macintosh, IBM & compatibles, Amiga and Atari ST.

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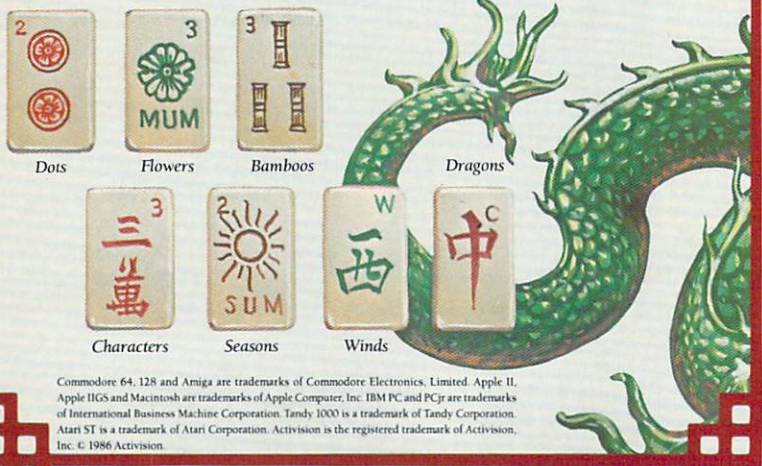

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CIRCLE READER SERVICE 3

ENTERTAINMENT

How People Find Out About Games

Basically, the answers here can be divided into two categories. Most of the time, our respondents learn about games by reading magazines, either reviews or ads. And about half the time, they hear about games by talking, either with friends or with salespeople.

MAGAZINE REVIEWS	**79%**
MAGAZINE ADS	**78%**
FROM FRIENDS/ASSOCIATES	**49%**
IN STORES	**48%**
TELEVISION ADS	**6%**

What Gamers Enjoy Reading About Most

REVIEWS OF GAMES	**83%**
TRICKS AND HINTS	**71%**
LIST BEST GAMES OF THE YEAR	**70%**
STRATEGIES ON PLAYING	**66%**
GUIDE TO BUYING GAMES	**60%**
ANALYSIS OF GAME GENRES	**39%**
INTERVIEWS WITH DESIGNERS	**25%**
HISTORY OF GAMES	**12%**

The Popularity Factor: What Types of Games Are Enjoyed Most

What do we mean by Popularity Factor? If a game genre received one vote from each respondent, its Popularity Factor would be 1.00; two votes and the Popularity Factor would be 2.00. Each genre could get more than one vote per reply because we asked readers for their family members' favorite types of games as well as their own. The numbers below are best judged by comparing one to another. For example, while Political/Military/Strategy (PMS) games, such as *Lords of Conquest*, had a Popularity Factor of 0.70 (seven-tenths of a vote per respondent), Strategy/Arcade games (like *Archon*) had a Popularity Factor of 1.32—almost twice that of PMS games.

Game Types	Pop. Factor
ARCADE	**1.88**
STRATEGY/ARCADE	**1.32**
TEXT/GRAPHIC ADVENTURES	**1.20**
SPORTS	**1.17**
REAL-LIFE SIMULATION	**1.17**
ROLE-PLAYING ADVENTURES	**1.16**
TEXT-ONLY ADVENTURES	**0.91**
STRATEGY & TACTICS	**0.90**
POLITICAL/MILITARY/ STRATEGY	**0.70**

The Top Ten Computer Games

After registering readers' favorites, it became clear to us that games that come in series—such as *Zork* and *Ultima*—are among the most popular. And, somewhat surprisingly, the venerable *Pac Man* is still popular enough to rate 10th place. (Note that respondents named approximately 3 games each as their favorites.) In addition, certain other fascinating figures came out. For instance, if you total the replies for three popular airplane simulators (*Jet*, *F-15 Strike Eagle*, and *Flight Simulator II*), there were votes from a large 26 percent of respondents. People love to fly! And if you put together all the numbers for various baseball programs (*Hardball* and *MicroLeague Baseball* were mentioned most often), you come up with a 12 percent response rate—enough to put our National Game in the top ten. (NOTE: *Fans will want to read next month's issue, as Tug McGraw, erstwhile star relief pitcher for the Mets and Phillies, looks at baseball game software.*)

1. ZORK I, II, AND III **16.6%**
2. ULTIMA II, III, AND IV **14.5%**
3. FLIGHT SIMULATOR II **13.8%**
4. KING'S QUEST I AND II **12.5%**
5. ONE ON ONE **9.8%**
6. SUMMER GAMES I AND II **8.6%**
7. LODE RUNNER **7.9%**
8. HITCHHIKER'S GUIDE GALAXY **7.8%**
9. JET **7.4%**
10. PAC MAN **6.9%**

Honorable Mentions

11. WIZARDRY SERIES **6.7%**
12. ARCHON I AND II **6.5%**
13. KARATEKA **5.8%**
14. BARD'S TALE **5.5%**
15. WINTER GAMES **5.3%**

We Have 10 Winners!

As promised, we have randomly chosen 10 people who responded to the survey as entertainment software winners.

Samuel Chen, San Jose, California
Onnie L. Duvall, Reistertown, Maryland
Jane Hall, Shreveport, Louisiana
Nancy Hardin, Aurora, Colorado
Bradley Jackson, St. Albans, Vermont
Steven B. Katz, St. Louis Park, Minnesota
Ronnie Koshimizu, Mission Viejo, California
Matt Newman, Fairdale, Kentucky
George F. Vonas, Toronto, Canada
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ACKNOWLEDGMENTS

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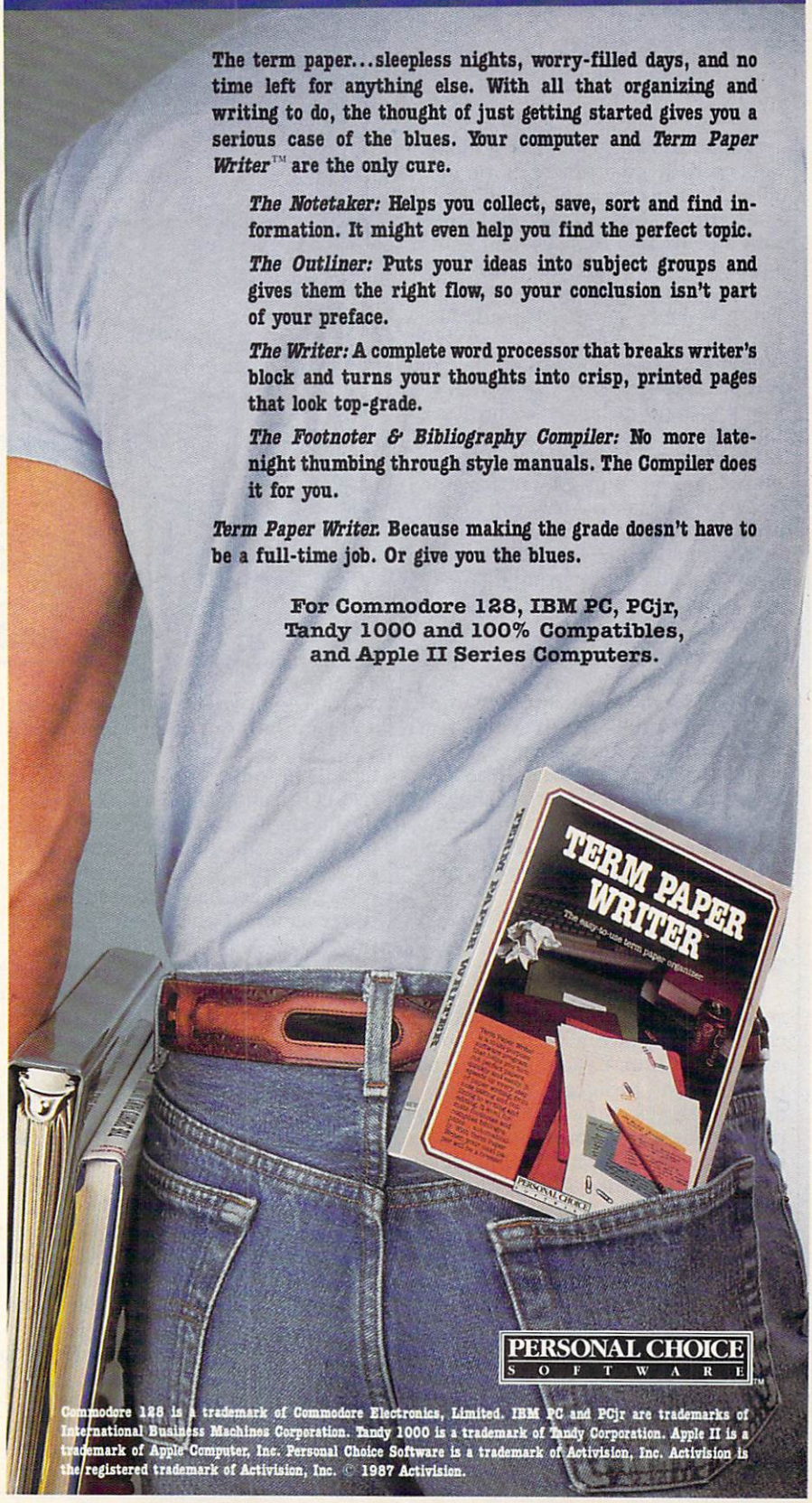

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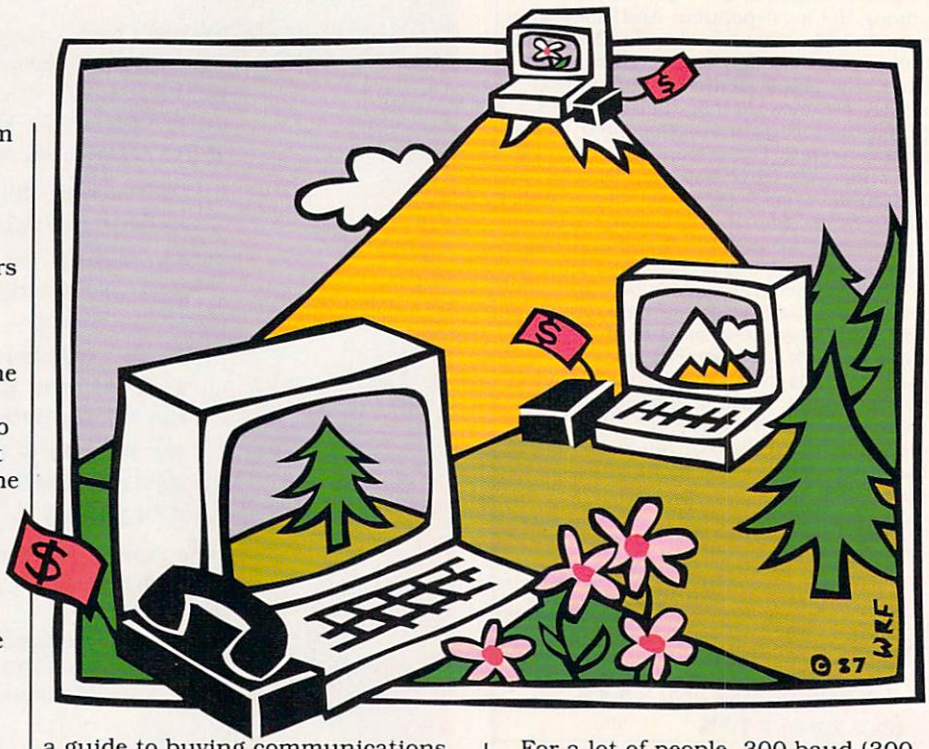
CIRCLE READER SERVICE 4

TELECOMPUTING

MODEMS IN THE MAINSTREAM
Tips for Buying the Practical Peripheral

BY RIC MANNING



It wasn't too long ago that a modem was considered a pretty exotic device. Most people who installed a computer at home would quickly add a printer to their system. But modems were like voice synthesizers and appliance controllers—something reserved for the dedicated hacker.

Times change, though. Today, one out of every five computer owners has a modem at home, according to Link Resources, a New York market research firm. In three years, say the market research people, nearly one in two computer owners will also buy a modem.

It's little wonder that people get excited about going on-line. Once you teach your computer to use the telephone, you have opened a window into the world of information and recreation.

A modem plugs a computer into global electronic-mail networks (with MCI Mail, for instance, you can send a message overseas for as little as $1), game-playing systems, banking and investing services, enormous stockpiles of public-domain software, and libraries full of research material.

AN ALCHEMIST'S VOCABULARY

Getting connected, however, can seem intimidating. Data communication has its own alchemist's vocabulary of bits, bauds, parities, parameters and protocols. But boiled down to the essentials, choosing the right modem and communication software can be no more difficult than choosing the right word processor.

Although the modem and the software must work together (and both must work with your computer), the modem is the more critical part of the equation. (Next month, watch for a guide to buying communications software.) And many modems are sold with software.

Most of today's modems have direct connections. All you do is pop in the standard telephone clip-plug to connect the modem to the wall jack. A double jack on the modem will let you connect the modem to the telephone handset at the same time.

The old-fashioned and less reliable acoustic modems are best used with portable computers. This creates a problem if you need to transmit from a hotel room or phone booth where the wall jack is unavailable.

Here's a look at some of the factors to consider when shopping for a modem.

SPEED (BAUD RATES)

If you fly to Europe, you can travel on a Boeing 747 or on the Concorde. The Concorde is faster and maybe you'll get better service, but it costs more. Traveling on either type of plane will get you to Paris safely. Modems offer the same sort of choices—and higher speeds and more amenities are generally going to cost more than "basic transportation."

For a lot of people, 300 baud (300 bits per second) is all the horsepower they'll need. At that speed, it takes about 60 seconds to transfer a page of text. That's fast enough for reading notices on electronic bulletin boards, sending brief electronic letters, and checking a stock price.

These relatively slow modems, however, are fast becoming the eight-track recorders of the computer world. The faster 1,200-baud models are getting cheaper all the time. A faster modem is almost a necessity for large-scale text transfers or software downloading.

The newer 2,400-baud modems can now be used with a large number of information services and bulletin boards, particularly those that have large software libraries. These super-fast modems (the text "flies" across your screen as it's being sent or received) are great for small-business users but are still priced a notch above the average on-line user's budget.

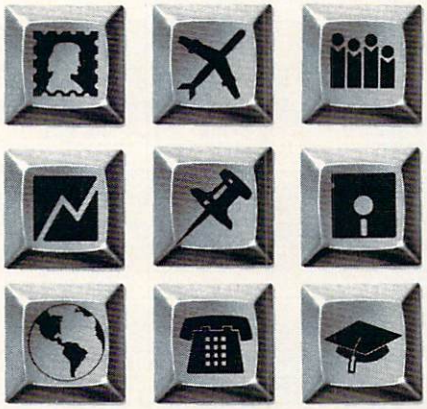
BRAND NAMES

In the modem business, there's one stand-out player and there's the cast. In 1985, Hayes Microcomputer Products built almost half of the

RIC MANNING *edits* Bulletin Board Systems *(11 Ferry Lane West, Westport, CT 06880), a newsletter about personal telecommunication. He welcomes electronic mail on The Source* (ID: STG007) *and CompuServe* (ID: 72715.210).

ILLUSTRATION BY WENDY FRIEDMAN

How to choose an online service



The Source is a carefully developed package of easy-to-use online services including electronic mail, computer-to-computer conferencing, travel services, business and investing information, Special Interest Groups, electronic bulletin boards, news, weather and sports, education, games, shopping and more.

Online services make your PC come alive. But before you settle on one, here are some helpful tips.

1 What are you going to need it for?

Some services cater primarily to investors, while others are trying to be *all* things to *all* people. The Source, on the other hand, offers a carefully developed blend of sophisticated communications tools, easy-to-find information and active Special Interest Groups that can be used for business support, personal enjoyment and household education.

2 What will it cost to learn?

After you find a couple of services that seem to fit your needs, ask about their tutorial offerings. If they don't have any, forget it. Beware of services that offer free connect time without a tutorial. This time gets used up fast and then you're on your own.

The Source has a free, award-winning tutorial that's an easy, step-by-step guided tour of services including business and investing, travel and communications. It gives you all the time you need to learn because there are never online charges for the tutorial.

3 Check out the customer support staff.

Can you get through to them easily? Are they helpful? Do you like them? Ask tough questions about the service and see if they can handle them. Our customer support number is 1-800-336-3330, by the way.

4 Be sure you get your money's worth.

This is tough sometimes. Services that advertise that they cost less, can end up costing more. Services that look like they offer everything can be a disappointment when you join and have to pay extra for the services you really wanted. Before you join, find out which services have surcharges or premium program charges. The Source is one of the few networks that doesn't offer a lot of "a la carte" pricing. We actually charge *less* for heavily used services like our Special Interest Groups.

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1,200-bps modems sold in the United States. A handful of others—Microcom, Ven-Tel, U.S. Robotics, and Novation—shared the rest.

Just as IBM set the standards for PCs, Hayes calls the shots in the modem world. Hayes products use a certain set of commands (ATtention, for example, tells the modem to wake up and await further instructions), and many software companies have written their communication programs to use those commands. So the other modem makers strive to make their devices "Hayes compatible" to take advantage of that software.

A modem that's not Hayes compatible isn't necessarily a bad modem, but it may require specialized software to work properly. And, if that software doesn't do exactly what you want it to, you may have no other options.

GUIDE TO MAJOR MODEM MANUFACTURERS

(Unless otherwise noted, all modems have Auto-Answer and Auto-Dial capability and can dial through both Tone and Pulse systems.)

Manufacturer	Model	Price	Baud Rate	Int./ Ext.	Hayes Comp.	Bundled Software	Comp/ Int.
Anchor Automation (818) 997-7758	Signalman Expressi	$399	1200	E	Y	N	RS-232C
	Si'man Lighting 24	$499	2400	E	Y	N	RS-232C
	Volks i	$199	1200	I	Y	Y	IBM PC
	Volksmodem 12	$199	1200	E	N	N	RS-232C
Apple (800) 538-9696	Personal Modem	$399	1200	E	Y	N	Apple II
Atari Corp (408) 745-2000	SX 212	$120	1200	E	Y	Y	Atari ST
	XM 301	$50	300	E	N	Y	Atari XE/XL
Cermetek Inc. (408) 752-5000	Applemate 1200	$295	1200	I	Y	N	Apple II
	Cermetek 1200	$395	1200	E	Y	N	RS-232C
	Cermetek 2400 SPC	$445	2400	I	Y	Y	IBM PC
Commodore (215) 431-9100	1660	$129	300	E	N	Y	C 64/128
	1670	$199	1200	E	N	Y	C 64/128
Hayes Microcomputer Products (404) 449-8791	Micromodem IIe	$199	300	I	Y	Y	Apple II
	Smartmodem 300	$199	300	E	Y	N	RS-232C
	Smartmodem 1200	$599	1200	E	Y	N	RS-232C
	Smartmodem 1200A	$439	1200	I	Y	N	Apple II
	Smartmodem 1200B	$549	1200	I	Y	Y	IBM PC
	Smartmodem 2400	$899	2400	E	Y	N	RS-232C
	Smartmodem 2400B	$799	2400	I	Y	Y	IBM PC
IBM Corp. (914) 765-1900	PC 1200 Modem	$499	1200	I	Y	N	IBM PC
	PC 2400 Modem	$699	2400	E	Y	N	IBM PC
Leading Edge (617) 828-8150	Model L 1200B	$150	1200	I	Y	Y	IBM PC
	Model L 2400B	$289	2400	I	Y	Y	IBM PC
Novation Inc. (818) 996-5060	Apple-Cat II	$319	300	I	N	Y	Apple II
	1200XE	$299	1200	E	Y	Y	RS-232C
	1200XE	$199	1200	I	Y	Y	IBM PC
	Professional 2400	$750	2400	E	Y	N	RS-232C
	Professional 2400	$650	2400	I	Y	Y	IBM PC
	J-Cat[1]	$149	300	E	N	N	RS-232C
Okidata (800) OKIDATA	Okitel 1200	$449	1200	E	Y	N	RS-232C
Prentice Corp. (408) 734-9810	Popcom C-200	$595	2400	I	Y	N	IBM PC
Prometheus Products Inc. (415) 490-2370	Promodem 300C	$119	300	E	Y	Y	Apple IIc
	Promodem 1200	$349	1200	E	Y	N	RS-232C
	Promodem 1200 A-2	$299	1200	I	Y	Y	Apple II
	Promodem 2400	$499	2400	E	Y	N	RS-232C
Supra Corp. (503) 967-9075	300 AT[2]	$50	300	E	N	Y	Atari XE/XL
	300 ST	$70	300	E	N	Y	Atari ST
U.S. Robotics (800) 342-5877	Sportster 1200	$149	1200	E	Y	N	RS-232C
	Courier 1200	$499	1200	E	Y	N	RS-232C
	Courier 2400	$599	2400	E	Y	N	RS-232C
	Microlink 2400	$599	2400	I	Y	Y	IBM PC
Ven-Tel Inc. (408) 727-5721	PC Modem Half Card	$399	1200	I	Y	Y	IBM PC
	PC Half Card 24	$599	2400	I	Y	Y	IBM PC
	1200 Plus	$349	1200	E	Y	N	RS-232C
	2400 Plus	$599	2400	E	Y	N	RS-232C
Zoom Telephonics (617) 423-1072	Zoom Modem PC	$299	1200	I	Y	N	IBM PC

[1]No Auto-Dial. [2]Pulse Dial Only.

INTERFACES

Like a printer, a modem needs a "bridge" to connect it to a specific computer. For Apple II computers and IBM PCs and PC compatibles, modems can be built right on a circuit board and plugged directly into one of the computer's internal slots, or they can be connected to an RS-232C serial port.

Other computers, such as the Commodore 64 and the 8-bit Ataris, have their own special ports for connecting devices, such as disk drives, printers, and modems. Using the built-in ports, however, can limit your choice of modems to those that can make that connection.

The most common way of plugging in a modem is with a device called an RS-232C interface, which comes standard on many computers. With an RS-232C port and special cables for your particular computer, you can choose most any type of external modem.

QUESTIONS

The chart that accompanies this story lists the features of several major modem brands and models. Here are some other questions you should ask when comparing modems:

Does the modem have a built-in speaker? Without one, you won't know if you've dialed a wrong, disconnected, or busy number.

Can you switch between voice (talking on the telephone) and data (talking through the computer) modes? This switching feature is particularly helpful when you're trying to swap files with another person and need to talk things over as you work.

Will the modem automatically sense and adjust baud rates? A good modem will listen for the baud rate of the host computer and match it or step down to a slower speed if there's a poor connection. FC

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Internal Modem 300/1200 BAUD	$199.00
Okidata 192 Printer	$399.00

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Included in the purchase price is MS-DOS, the standard IBM operating system. With our Hard Disk Computer, you also get HOMEBASE, a general purpose multi-function program to perform word processing, electronic filing, and data base management. HOMEBASE has a built-in calendar, with monthly, weekly, and daily scheduling. The Homebase Calculator lets you perform calculations on the monitor and the ability to print a paper tape if desired. HOMEBASE also includes a communication program with autodialer for communication with other computers (requires a modem).

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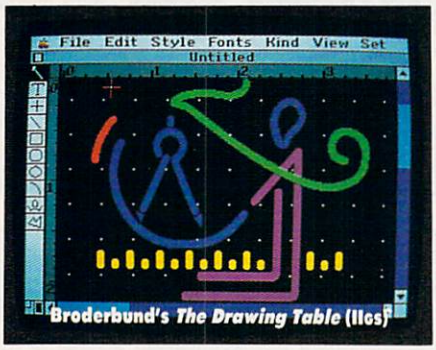
CIRCLE READER SERVICE 2

MACHINE SPECIFICS

APPLE

BY CHARLES H. GAJEWAY

Publication deadlines being what they are, 1987 has long begun for you, but still lies a bit away as I write this. It's a good time to take stock and see where we stand in the Apple world.



This is my seventh year of involvement with personal computers, and I am just as enthusiastic about their potential and power today as I was the very first time I booted *VisiCalc* on my Apple II Plus and felt horizons and limitations disappear. Since then, a seemingly endless stream of innovative and useful products has held my attention and allegiance firmly in the Apple world.

Life A.V. After *VisiCalc*, there was *VisiPlot*, then a series of better and better word processors, along with the 80-column screen display. Then came memory expansion with the introduction of Titan cards and RGB cards. Apple IIe followed with ProDOS, a big improvement, and later, *AppleWorks*. Products such as affordable hard-disk drives and the Apple 80-column color monitor keep coming for the II line. And, of course, the Macintosh came along to define the state of the art in computing, and to capture me.

In future columns, I'll try to pay heed to the three Apple lines—the old Apple II world (II Plus, IIe, and IIc), the new Apple II world (GS), and the Macintosh.

Apple II. The spotlight of late has been focused on the new IIGS. Its expanded memory, increased speed, superior graphics, and sound are exciting new sources of power for computer users. But as I have been exploring the GS and related new products, I can't help marveling at how much of what is being done on the GS can be accomplished just as well on a II Plus, IIe, or IIc.

This is important, especially for II Plus and IIc owners who have no upgrade path to the GS and may be feeling a bit abandoned. There is plenty of life and power left untapped in Apple's older machines. If you want more speed, you can add an accelerator card. If you want more memory, you can add a memory expansion card. If you want RGB output or better sound, you can add the appropriate cards.

About the only thing you can't do with your old II that you can do with the new GS is get high-resolution color graphics. Color graphics are a bonus, but for routine, everyday tasks, you just don't need them.

Macintosh. Recently, a good deal of my corporate life has revolved around integrating the unique power and capability of the Macintosh into an environment that had elevated the letters IBM into an icon of near worship. The resulting excitement and accomplishment have been gratifying, especially in light of a slow and difficult start.

There are signs that excitement for the Mac is spreading across corporate America, welcome news to those who recognized the Macintosh as the true state of the art in personal computing, and have taken a lot of grief from those who followed a "safer" path. And there is more than a little humor involved, at the expense (finally!) of the IBM elitists.

I recently burst out laughing after reading through a popular IBM-oriented publication. Why? Because the entire magazine was devoted to telling its readers how to turn an IBM PC/AT into a Macintosh, and how productive it would be—all for the modest price tag of $15,000! Good things truly do come in small, reasonably priced packages.

Speaking of price! Now that the Mac Plus is selling to corporations and Apple is about to introduce a new model of the Mac, prices on the old Fat Mac (with 512K and a disk drive) are falling into the $1,000 range. That makes it less expensive than the new IIGS, and about the same price as the Atari 1040ST.

GEnie's Gray Ghost. I just signed up with GE's bargain electronic information service, GEnie. It's only $5 per hour for 1200-baud use during non-prime time (nights and weekends). Those of you who have modems and subscribe to GEnie, please send mail (with questions, comments, and tips) and watch for Gray Ghost on the CB channel.

CHARLES H. GAJEWAY *can be reached on GEnie (*ID: C GAJEWAY*) and The Source (*ID: BBQ794*).*

ATARI

BY JOHN J. ANDERSON

First off, I'd like to thank all of you who have taken the time to contact me by mail or e-mail. I'm listening. One message is coming in loudly and clearly: how many of you long for more programming material. This month's column is for you.

8-bit Tips. Here are some tidbits for our 8-bit Atarians (tested under DOS 2.0): To determine which revision of Atari BASIC you have, type PRINT PEEK (43234). If the result is 162, you have revision A; if it is 96, you have revision B; if it is 234, you have revision C.

Need to format a disk from BASIC? You don't have to back out all the way to DOS. Do it with a one-line BASIC program: 1 XIO 254, #1, 0,0, "D:" Load this program and then don't forget to put in a new disk before you run it! Want to format a disk in the direct mode? Try typing X=USR(3352).

Have two files on disk with the same filename? This can be a nasty occurrence, but there is a way around it: Copy the loadable (first) file to another disk as a backup. From BASIC, type POKE 3118,0 (RETURN). Go to DOS, and rename the file (only the first file will be renamed). Go back to BASIC and type POKE 3118,184 (RETURN). You should now be able to access both disk files on your original disk.

Want to disable the BREAK key in your own programs? Insert the following after every GRAPHICS command: POKE 16,64:POKE 53774,112. Remember, once is not enough with this one. You've got to keep disabling the BREAK key after each of the commands listed above.

Want to disable the entire keyboard? POKE 16,255 will do that for you.

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PARALLAX-CD

MICRO MERICS PARALLAX-CD lets owners of all COMMODORE® home computers connect any letter quality or dot matrix parallel printer to their system. PARALLAX-CD emulates COMMODORE's own 1525 graphic printer when used with any other printer interface. All switches are externally accessible, and settings are clearly marked on the cover. PARALLAX-CD uses Compute Gazette mnemonics, and features 22 available print modes. It is simple to use, yet still allows the flexibility an expert programmer may need.

MICROBUFFER

MICRO MERICS MICROBUFFER lets you keep working while your printer keeps printing. Stationed between your printer interface and your printer it stores the output from your computer until the printer can finish printing. Available with 32K of memory, or, for larger jobs, 64K.

MICROMODEM-AT

MICRO MERICS MICROMODEM-AT is a standard 300 baud modem that provides excellent performance for the ATARI computer user. It is designed to connect directly to any ATARI computer and to a standard modular phone cord. It uses the Bell 212A/103 protocol to allow connection to any Hayes or Bell standard modem, and features both auto-dial and auto-answer.

MICROMODEM-CD

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CIRCLE READER SERVICE 29

MACHINE SPECIFICS

Want to create a run-only file? Give this one a try: 32767 POKE PEEK (138)+256*PEEK(139)+2,0:SAVE "D:FILENAME.EXT":NEW. Insert this line into your program (make sure you save a normal version of the program first), and then type GOTO 32767 (RETURN). The resulting file can be run normally, but not listed.

Need a random number between 0 and 255? Sneak a PEEK at memory location 53770.

Want to create a MEMSAVE file from BASIC so you don't lose your program when you go to DOS? All you need to do is type A=USR(5947) (RETURN). (Owners of XL series computers will need to hit RESET after the disk stops spinning.)

Handy ST Tips. Before our 16-bit friends start to feel neglected, let's move on to some ST tips.

Tired of looking at the label FLOPPY DISK on disk icons? Select a disk icon with a point and click, so that it darkens. Then move the pointer to the OPTIONS MENU, and select INSTALL DISK DRIVE. Type in a new name of your choice. Then select INSTALL. If you now save the desktop, the name change will be recorded permanently.

Wish you could start an application by double-clicking on a data file? Easy. Let's say you always boot *ST-Writer*, and then open files from there. Try this: On the desktop, click once on the application program icon (in this case, *ST-Writer*), so that it darkens. Now go to the OPTIONS MENU and select INSTALL APPLICATION. In the field called "Document Type," enter the three-character extender for the file type associated with the application.

In this case it might be .DOC, but you can do the same with *Degas* files (.PI1, .PI2, or .PI3), or any other application data files with similar extenders. Next, save the desktop to make this a permanent capability. You can now double-click on any document file and open automatically to that file under the application it calls. Just like that fruity computer with the tiny black-and-white screen! (*Note: The application and the data files must reside on the same disk for this to work.*)

Tired of needing to close and reopen a window when you switch disks? When you pop a disk out of any ST drive and then stick in another, you still see the directory for the old disk. Instead of closing and reopening the window, just tap the ESCape key. The new directory will read automatically. ESCape will also clear text from dialog windows. For example, pressing the ESCape key in the date field on the control panel will clear the field and set the cursor at the beginning, so you can enter a new date.

Want to give your mouse a rest? No problem. Did you know that by holding down the ALTernate key and pressing the cursor arrow keys, you can move the pointer all around the screen eight pixels at a time? If you press SHIFT-ALT and the cursor keys, you can move one pixel at a time. With the ALTernate key held down, the INSERT key can act as the left mouse button, while the CLR/HOME key acts as the right mouse button. This can be handy when you want to move the pointer but don't want to take your hands off the keyboard.

JOHN J. ANDERSON *can be reached on CompuServe* (ID: 76703,654).

COMMODORE

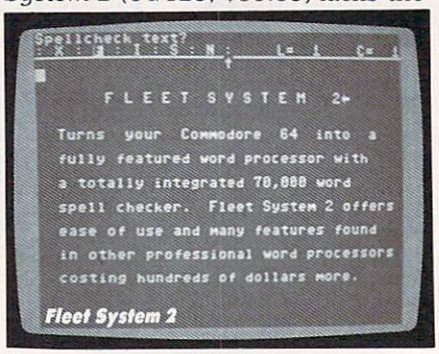
BY SHAY ADDAMS

Word processors are a boon for writers—unless you decide to write about them and have to sort through scores of programs. I've just done that, and here are my notes. *Superscript 128* (Progressive Peripherals and Software, Inc.; [303] 825-4144; $79.95) may be the best for overworked writers because its macro capability lets you automate any series of keyboard actions and execute them by hitting a key. And the word processor may be integrated into memory with *Superbase 128* ($99.95), so you have instant access to your data base. (Remember, with C 128 word processors, you'll need an RGB monitor to use fancy features like on-screen italics.)

For producing newsletters, *WordPro with Turbo Load and Save* (*WordPro 64*) or *WordPro 128 with Filepro* (Spinnaker; [617] 494-1220; $39.95 each) prints double columns at a single swipe. Hasty keyboarders will like the Undo feature that restores the most recently deleted text. *Word Writer*'s pull-down menus make it very easy to use on the 64 or 128. Both are *GEOS* compatible and include spell-checkers.

With window-based menus and a spell-checker, *Better Working Word Processor with Spell Checker* (Spinnaker; $49.95) is also friendly. If you're on a budget, look for *The Critic* (Quantum Leap; [619] 297-1078; $19 for the 64, $39 for the 128).

PaperClip Elite. *Fleet System 4*, for the 128 (Professional Software; [800] 343-4074; $79.95) has a built-in dictionary, thesaurus, spell-checker, and data base; *Fleet System 3*, also for the 128 ($69.95), does not include the data base. *Fleet System 2* (64/128; $59.95) lacks the



thesaurus and data base.

PaperClip Elite (Batteries Included; [416] 881-9816) includes integrated communications software; the Amiga version has multiple windows, an outline processor, spell-checker, and the ability to mix graphics and text. There was no price set at press time. *PaperClip II* for the 128 ($79.95) is a word processor with a spell-checker and telecommunications built-in.

Two other practical Amiga programs are *Scribble!*, version 2.0 (Micro-Systems Software, Inc.; [800] 327-8724; $99.95), which supports cut-and-paste text for up to four windows to show many different files; and *Textcraft* (Commodore; $99.95), which has built-in forms for memos, business letters, and so on. Check with your local Amiga dealer for packages.

***GEOS* Update.** The packaging doesn't mention it, but *geoDex* and *DeskPack 1*—two new utilities from Berkeley Softworks ([415] 644-0890; $39.95)—also give you a new *GEOS* desktop (version 1.3) ($59.95), plus updated versions of *geoWrite* and *geoPaint*. Keyboard shortcuts are now permitted on the desktop and in *geoWrite*, which even lets you use the cursor keys to move around a document. Also included on the flip side of both programs are 15 new printer drivers, input drivers for the Koalapad, a light pen, Commodore's proportional mouse, and upgraded versions of the photo and text managers. (Some of these goodies may be downloaded from QuantumLink.)

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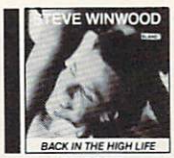

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GeoWrite users should definitely get the new version.

GeoDex looks like an on-screen Rolodex and will print mailing lists and even auto-dial the phone number listed on a *geoDex* card. With *geoWrite* and *geoMerge* (on the same disk), you can print form letters with the *geoDex* data.

Three of *Deskpack 1*'s accessories—a calendar, icon editor, and a blackjack game—are just novelties. But the *Graphics Grabber* vastly increases the graphic capability of *geoWrite* and *geoPaint* by enabling you to import graphics from *The Print Shop, The Newsroom* and *PrintMaster*. (Epyx has launched a line of Graphics Scrapbooks, each containing 100 images of clip-art compatible with *The Print Shop* and *Printmaster*. The first subjects are Sports and Off-the-Wall-Graphics.)

Amiga Memory Expansion. There are two new memory expansions for the Amiga: aMEGA and Alegra. The aMEGA Board ($549.95) upgrades a 256K computer to 1 megabyte and comes with several useful utilities and an expansion port for extra boards, cards and other add-ons (C Ltd; [316] 267-6321). Or you can get a 512K memory boost with the slim Alegra, which goes for $379 and can be upgraded to 2 megabytes (Access Associates; [408] 727-8520).

Q: What's the best color printer for use with a 64? Are any laser printers compatible with it?

A: The Okimate 20 is the most convenient color printer, since many programs already have drivers for it. But *GEOS* has printer drivers for the Apple Imagewriter II or the Epson JX-80. With *GEOS* software, you can also use laser printers from Apple, Hewlett Packard, or Okidata.

SHAY ADDAMS *can be reached on CompuServe* (ID: 72267,601) *or QuantumLink* (ID: JB CHALMER).

IBM/MS-DOS

BY HENRY BEECHHOLD

Did you know that a two-hour videotape can store 80 megabytes of computer data? So why let your VCR sit around most of the day doing nothing? The Videotrax tape backup system will dump your data in either VHS or Beta format. Backups made this way can be run from any compatible VCR. You cannot play the videotape, however; you must load the data back into the computer first. The cost is $595 for the controller card, and $1,395 for the controller card and VCR (manufactured by Alpha Micro; distributed by Priority One Electronics, 21622 Plummer St., Chatsworth, CA 91311; [800] 423-5922).

CGA Colors. A reader asked, "Why do game and other graphics-oriented programs fail to use more than four of the 16 available PC colors?" The fact is that a color/graphics adapter like the standard IBM Color Graphics Adapter (CGA) can handle only so much information. Color and graphics both demand lots of memory. The higher the resolution, the fewer colors can be shown with a given amount of memory. The CGA board can display four colors in medium resolution and 16 colors in low resolution. The Enhanced Graphics Adapter can display 16 colors in high resolution, but right now few game programs are written to work with the EGA adapter.

Prompt Attention. You're not necessarily stuck with that tired old MS-DOS screen prompt (›). With a color monitor, you can have a prompt that tells you what directory you're in—and does so in a different color than the text. (I'm partial to a cyan prompt and yellow-on-black text.) To do so, you must have the line DEVICE = ANSI.SYS in your CONFIG.SYS file.

For automatic installation of your custom prompt every time you boot up, you need to create an AUTOEXEC .BAT file or add the necessary information to the existing one.

You can create the file with any text editor or word processor, or with the COPY command, as follows: (Note: press ENTER after each line):

```
COPY CON AUTOEXEC.BAT
ECHO OFF
PROMPT $E[36;40m$P$Q$Q$G$E[33;40m
```

(Press CONTROL-Z or Function Key 6. Then press RETURN.)

The first line creates the files; ECHO OFF keeps DOS from printing the file on the screen while it's being run; CONTROL-Z marks the end of the file.

Here's what the numbers mean: 40 is black, 36 is cyan, and 33 is yellow (see your manual). The $p qq$g sequence results in an arrow prompt that indicates the present drive and directory path in this fashion: C:\WP\MYFILES =›.

Other prompt commands include $B (vertical bar), $D (date), $L (<). You can even include text if you wish, such as WHAT IS YOUR COMMAND MASTER? To return the prompt to its plain dull self, type PROMPT any time you are in DOS.

Fancy Printing Cheap. To really take advantage of your printer—at a modest cost—try *PowerText Formatter* ($89.95, plus $5 for shipping and handling). The program works with any ASCII-producing text editor and can, with relatively little tinkering on your part, produce handsome multicolumn newsletters, scripts and screenplays, customized form letters (using the built-in merge-printing routine), reports, memos, academic papers, and whatnot.

The program, which supports ordinary printers as well as lasers, makes tables of content, indices, and footnotes. The results with a laser printer are most impressive. Use the formatting files (templates) provided or use your own (Beaman Porter, Inc., 417 Halstead Ave., Harrison, NY 10528; [914] 835-3156).

Sick Computer? If you have access to a working PC while yours is on the blink, you might be able to diagnose and even cure your problem with *ServTech*, a program that tracks down the source of hardware malfunctions. It interprets system diagnostic messages, and through a series of questions helps you isolate the probable causes of trouble (Rylos Technologies; 10213 Heron Pond Terrace, Burke, VA 22015; $44.94).

HENRY F. BEECHHOLD *is author of* The Brady Guide to Microcomputer Troubleshooting & Maintenance *(Simon & Schuster, $17.95).*

TANDY

BY STEVEN MILLER

Bob Rosen's Spectrum Projects, in Howard Beach, New York, specializes in products for the Color Computer. He recently sent a note—almost before the CoCo 3's were on the market—with some tips on using the new machine's extended BASIC commands. Here they are: 1) To use a monochrome monitor, type WIDTH 40: PALETTE 8,255: PALETTE 0,0:CLS9. 2) To get true lowercase in the 32 x 16

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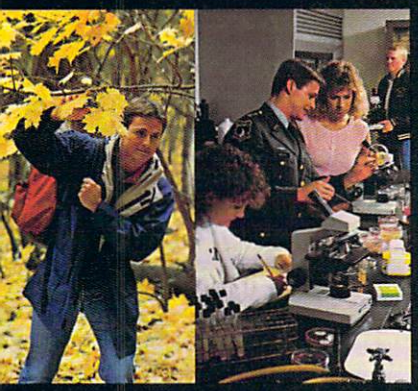

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mode, type POKE &H95C9, &H7H:POKE &HFF22, &H10. 3) To get the inverted screen mode, do an additional POKE &HFF22, &H20. 4) Finally, for a real surprise, hold down the ALT and CTRL during power up! (I'll tell you non-CoCo owners what the surprise is next month.)

Display's the Thing. Tandy sells several monitors that take advantage of the CGA (color/graphics adapter) standard in MS-DOS machines—the CM-5 and CM-10. Tandy is now moving up to the EGA standard with the new EGM-1 monitor.

While I can't see all families spending the kind of money (nearly $1,000 for the monitor and the EGA card to power it) necessary to get the EGA's high-resolution color displays, it sure is nice to see crisp, clear, colorful words and sharp graphics on the monitor. Heavy users should consider this enticing upgrade.

New CoCo 3 Software. Shortly after receiving these tips, I got the first of Spectrum Projects' new CoCo 3 software. In fact, it was the first third-party CoCo 3 software I had seen. *CIII Graphics* is a drawing program that takes advantage of the new colors available on the CoCo 3. It's a fairly sophisticated program, yet simple to use, with joystick control and self-generating standard shapes (circles and squares).

I didn't get very good results because my artistic ability is nil, but my son whipped up a nice picture of the solar system in about five minutes. *CIII Graphics* sells for $19.95, plus $3 shipping and handling.

The second Spectrum item we received is more useful to all CoCo 3 owners interested in doing their own programming. It's a booklet called *CoCo 3 Secrets Revealed*. While the folks at Tandy might disagree with Rosen's version of the history of the Color Computer, it was fascinating to see how someone who obviously loves the CoCo views its development.

Even if you don't care anything about the life story of the Color Computer, the book has plenty of tips about using it. "*Secrets*" should make a nice addition to the extended BASIC book that is supplied by Tandy. *CoCo 3 Secrets Revealed* supplies the why as well as the how of using the CoCo 3. The booklet is a bit expensive ($16.95 plus $3 shipping and handling) for 30-odd pages of information packaged not much better than your average typewritten newsletter. But you're paying for the information, not the packaging. Incidentally, *CIII Graphics* and "*Secrets*" can be purchased together for $29.95. For more information about Spectrum Projects' products, write to P.O. Box 264, Howard Beach, New York 11414; (718) 835-1344.

Cable Confusion. Several Tandy 1000 owners have written to ask about the unusual shielded printer cables supplied with their computers. Tandy advises that you use them—and not standard IBM-type cables. The concern from some owners is that if you plug in a standard cable, the computer will be damaged. Tandy assures me that no such thing will happen. The reason they are furnishing the shielded cables is to conform to FCC regulations on interference with other electrical devices.

Next month, I'll take a look at more new software for the CoCo 3.

STEVE MILLER *is a freelance writer and computer consultant.*

ORPHANS

BY PATRICK SPERA

What is a TIcoff? It's the Texas Instrument Computer Owners Fun Fair, scheduled for March 28, 1987. It will run from 10 a.m. to 6 p.m. at Roselle Park High School, Roselle Park, New Jersey. The proceeds from the fair will benefit the Student Council Scholarship Fund.

In addition to displays, seminars, and a flea market, there will be a demonstration of the new TI 99/4A compatible, Myarc Gen'eve. At the time of this writing, it's still in preproduction. Keep your eyes glued to this page in months ahead and I'll try to keep you up-to-date on this machine.

For more information on TIcoff, please contact one of the following people or groups. On CompuServe, leave an Easyplex to TIcoff (ID: 73547,2014) or leave a message on TI-FORUM. GEnie users can leave e-mail to TICOFF. You may also call the following telephone numbers: Central Westchester 99'ers, (914) 528-5402; Long Island 99'ers, (516) 938-1095; NEWJUG users, (201) 686-5619; New Jersey 99'ers, (201) 838-7637.

Timex/Sinclair Disk Drives.

One major thing that has driven Timex Sinclair owners crazy is a lack of disk drives. There is nothing more disheartening than to see a six-minute tapeload fail. Wouldn't it be grand to have a disk so you could see the load fail in seconds instead?

All kidding aside, you might want to consider the Aerco Disk Interface (FD-68) (Box 18093, Austin, TX 78760; [512] 451-5874). The TS 2068 version comes with the disk interface, an RGB interface, 64K of RAM (expandable to 256K with some rewiring), one disk drive, and a case and power supply ($377). For $25 more, you can purchase a user license for RPM, which is a CP/M upgrade.

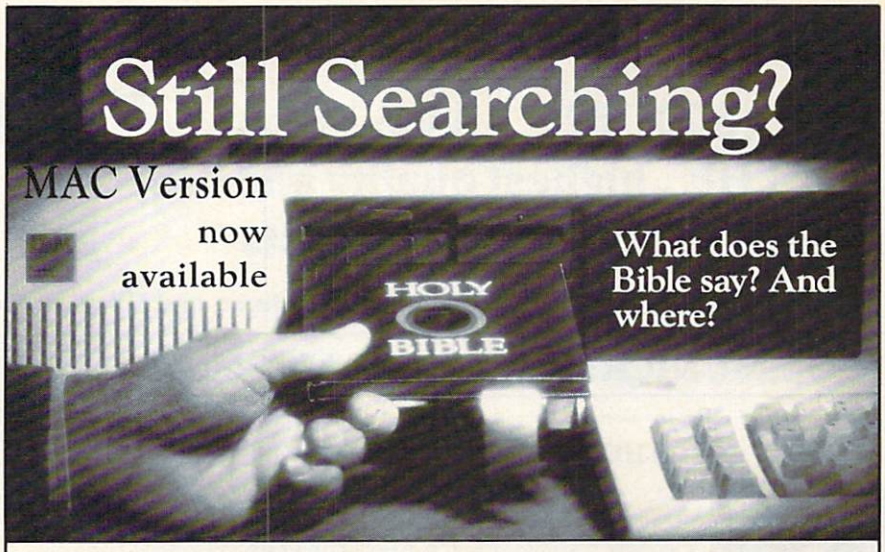
RPM will run CP/M 2.2, which is the gateway to thousands of programs for Timex users. The RPM system disk is also crammed with utilities, so you will have a ready-to-use system. With the many CP/M users' groups around the country, a lack of programs might never be a complaint again.

An Aerco disk interface (FD-ZX) and drive is also available for the TS 1000/1500 ($360), but it does not include the extra memory or RGB interface.

Adam Disk Drives. Adam users are lucky that Coleco released a disk drive for the Adam, which was originally sold with digital tape drives. The bad news is that the supply of disk drives is starting to dry up. But some retail stores on the East Coast still have them in stock, as do several Adam mail-order houses. Call the following dealers to find out which ones still have drives in stock: NIAD, (312) 961-3529; M.W. Ruth Co., (609) 667-2526; Alpha-One LTD, (718) 336-7612. Don't forget to tell them where you got their name! Yeah, it's a cheap plug, I admit.

But what if you already have the Adam disk drive and it's acting up? Or you'd like to store more on every disk? Enter EVE Electronic Systems (320 Union St., Millis, MA 02054; [617] 376-4919). EVE repairs disk drives and will upgrade them. EVE pulls the guts from your current system and installs a double-sided drive in its place. This boosts your original 160K storage to 320K. (If you use CP/M 2.2, you can only access 270K.) The cost of this modification is $150.

PATRICK SPERA *can be reached on CompuServe* (ID: 76703.4350).



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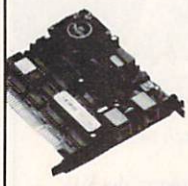

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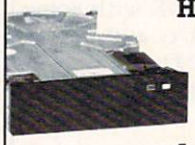

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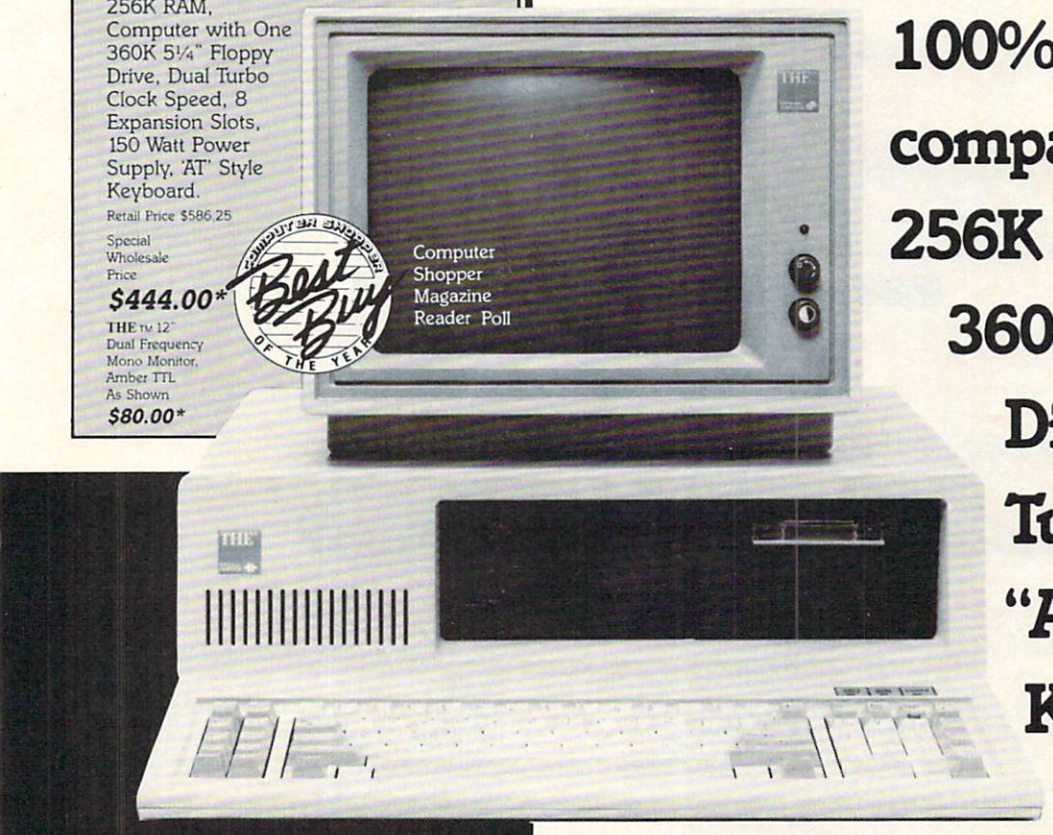

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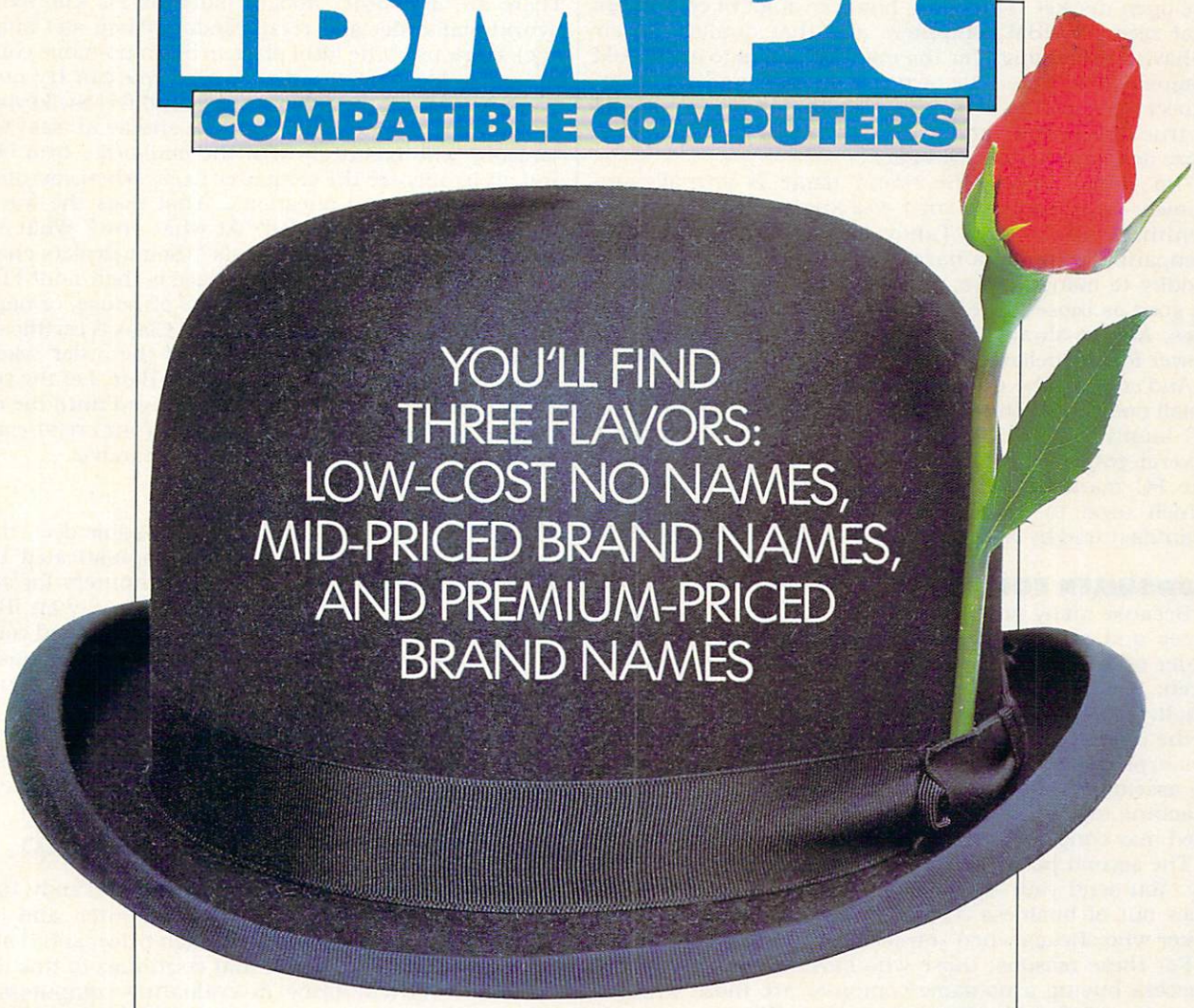
BUYER'S GUIDE TO IBM PC COMPATIBLE COMPUTERS



PHOTOGRAPH BY ANTHONY LOEW

Plunging prices on IBM PC-compatible computers have brought droves of new buyers into the market. Many want PC compatibles to do business at home; others feel safe buying what is considered an industry "standard"; still others can't resist the low prices.

If you're shopping for an IBM PC-compatible computer in the current market, you're probably pretty confused. You could, of course, take the easy way out and buy an IBM. Depending on your needs and your finances, it might be the right way. But beyond that, you can shop for IBM compatibles in three main categories: low-cost no names; mid-priced brand names; premium-priced brand names.

Figuring out where to shop can be as complex as taking a personality test. So on the following pages, we can help you with the difficult decisions by describing each category and its advantages and disadvantages.

LOW-COST NO NAMES

"No-name IBM clone"—what does this mean? Strictly speaking, a clone of anything is literally a duplicate. Since the law looks with disfavor on literal copies of commercial products, there are no *true* IBM clones on the open market. There are, however, a lot of computers that resemble IBM computers and that duplicate their behavior well enough for the manufacturers to claim IBM compatibility. Thus, the owner of such a compatible can expect the machine to run software that requires an "IBM or true compatible," and to use much of the add-on hardware designed for the IBM PC.

"No name" means the brand name is virtually unknown—as opposed to such well-known names as IBM, Zenith, AT&T, Compaq, Tandy, and others. Because IBM-compatible computers have become somewhat of a commodity to manufacture, many of the unknowns are just as good as those made by IBM and other familiar companies. Almost always, they offer many more features and power for the dollar.

And some of the no-name manufacturers are making a small name for themselves within the computer industry. PC Limited and PC Network have been in business for several years. Wells-American is a relative newcomer to the PC marketplace, but an old company. Blue Chip, which used to market printers, now sells computers manufactured by Hyundai, the Korean car manufacturer.

CONSUMER CONCERNS

Because many no-name computers have obscure pedigrees and are commonly sold by mail- and telephone-order only, potential purchasers are often wary. And indeed, two big problems could arise. The first is lack of quality. Let's be honest: There's plenty of junk out there. If the price is surprisingly low, the equipment may prove *un*surprisingly bad. Most no name compatibles are sold by assemblers, not manufacturers. A particular Brand X machine may be splendid, but the next Brand X assembled may consist of completely different components.

The second potential problem is lack of dealer reliability. You send your dollars into the void, and the dealer goes out of business. Or the dealer is simply an order taker who shrugs when you tell him your troubles.

For these reasons, those who have the best chance of success buying a no-name computer are those who are most knowledgeable about computers. What may be minor difficulties for experienced users could be major problems for neophytes.

PRICE

Brand X IBM PC compatibles are priced from about $400 to about $1,000, depending on the degree to which the computer is "stuffed." For $400, however, you don't get a full working system. You'll probably have to add a video display board and a monitor before you can even use the system. The beauty of buying an open system is that you can stuff it yourself with components suited to your needs, such as a hard-disk drive or an enhanced color graphics adapter.

The $1,000 model is likely to include 640K, two disk drives, a monochrome monitor and display card, and parallel and serial ports. That's a very good deal—assuming the computer works well, has a decent keyboard, and won't fall apart.

How can you tell that? To some extent, it depends on how you buy the computer and whether or not you can see and touch it before you buy it.

WHERE TO BUY

Nowadays, no-name compatibles are sold through virtually every merchandising channel, except franchised computer retail chains. Discount chain stores such as K-Mart, Target, and Caldor stock Blue Chip computers. Local computer stores sell PC compatibles with the store's own name on them, known as "house brands." There are mail-order houses (such as PC Limited) and hybrid mail-order and retail vendors (such as Computer Age). Obviously, the ideal place to buy a no-name computer is at a local retail outlet, where you can try out the computer, check the video display, and feel the keyboard.

If you buy through the mail, you should at least talk to someone who has dealt with the mail-order firm before, and preferably see the computer itself. When you talk to a vendor, ask several questions. What does the warranty cover? Can it be extended? At what cost? What is the return policy on damaged goods? (Some dealers charge a "restocking fee," even if the damage is their fault.) Check the repair policy—is it in-house, out-of-house, or nonexistent? Do the components have FCC Class B certification?

When you order, get the name of the order taker, an order number, and a definite delivery date. Let the vendor know that you do not want to be charged until the day of shipment. Some vendors will charge your credit-card account long before they ship the merchandise.

WHO SHOULD BUY?

Unless you stumble across an irresistible deal, the no-name category is best left to the sophisticated buyer. Typically, someone who has used computers for several years (especially those familiar with the way an IBM PC works) will buy a no-name computer as a second computer. Alternatively, a home-business or small-business owner will buy several no-name computers to use as workhorses.

If you hit it right with a no-name, you save a lot of money; if you miss, you may cause yourself a lot of aggravation.

—HENRY BEECHHOLD

MID-PRICED BRAND NAMES

In December 1984, Tandy introduced its Tandy 1000. It was the company's first MS-DOS computer, and it sold for $1,299. That was a breakthrough price, and it started the whole downward spiral that continues to this day.

Price is a tricky issue in evaluating computers, and IBM compatibles are even trickier than most computers because they can be sold in so many different configurations. Advertisements for computers rarely include outright lies, but their "sins of omission" can be misleading.

But Tandy and—right on their heels—Leading Edge, the first companies with brand-name identities that began selling IBM compatibles at consumer-level prices, put an end to this chicanery. Their computers work when you take them out of the box and plug them in, plus they have the basic connections (parallel and serial ports) needed for a printer and modem.

This packaging strategy clearly has price advantages for the consumer, since it is cheaper for the factory to install the required components while building the machine than for buyers to purchase individual cards and plug them in themselves. It also makes buying a computer a lot simpler. Nobody has yet figured out a way to make an IBM-compatible computer as easy to operate as a household appliance, but at least if you go shopping for a toaster you don't have to worry that the heating elements will be sold separately.

At the same time, price is becoming less of an issue

with each passing week. From the low-end to the high-end, the prices are all moving in the same direction—steadily downward—and in the process the gap is narrowing among categories. As price differences become less significant, what other factors should you consider?

EQUIPMENT FEATURES

When you want to expand the capabilities of your IBM-compatible computer, you generally add a card—a printed circuit board (with electronic components installed) that fits into a slot in your computer. In theory, the more slots your computer has, the more expansion potential you have. But there's more to it than simply the number of slots. You also have to consider how many slots will be taken up by basic equipment, like a display adapter.

When the manufacturer builds these basics into the system unit, it leaves more slots free for later expansion. The Leading Edge Model "D", for example, comes with both monochrome and color display adapters built in and room for 768K memory on the motherboard. (Some computers require a circuit board in one of the slots.) This leaves more free slots open for future system expansion. In a 768K system with two floppy disk drives and a monitor installed, the Leading Edge will have four open slots.

Another important consideration when choosing a computer is the keyboard. Layouts vary somewhat, but all the compatibles provide the full set of keys you need. The feel of each keyboard brand varies widely, though, and that's important. To some degree the choice is a matter of personal preference, but some low-cost compatibles come with keyboards that feel so "mushy" that nobody would find them desirable. With mid-priced and high-priced compatibles, you can probably try out the keyboard at a retail store; that's usually not true with the lower-priced computers, which are often sold by mail order only.

The same holds for the screen display, which also varies widely in quality. And keep an ear out for the decibel level of the cooling fan. The Leading Edge fan, for instance, is loud. It's not something you're likely to pay attention to in a store, but you should. You'll be hearing a lot of that noise in the months ahead.

SOFTWARE INCLUDED?

One piece of software that is an absolute necessity and is included with the purchase of the mid-priced brands, is MS-DOS. This operating system-on-a-disk costs about $90 at retail outlets. Again, lower-priced and higher-priced computers are often sold without MS-DOS. The BASIC programming language is also included with most mid-priced machines at no extra charge. In addition, many of these computers come with valuable applications software at no additional expense.

WARRANTY AND SERVICE

A long warranty from a company likely to be around long enough to honor it is a very significant consideration. IBM and several of its corporate-level competitors sell computers with 90-day warranties. While Tandy is also in the 90-day category, other manufacturers in the mid-price range offer a full year's coverage, with Leading Edge extending their warranty to 15 months.

Several mail-order companies have recently extended the warranty coverage on their "house-brand" PCs as well. However, it's considerably easier to carry your wounded computer into a local dealer and explain the problem face-to-face than to pack it up and ship it off to a mail-order firm for service.

WHAT YOU NEED TO USE AN IBM PC COMPATIBLE

Buying an IBM PC-compatible computer can be tricky because the system unit can be sold bare bones or loaded. So you have to know what you need to make the right purchase decision. Otherwise, you may come home and find you need several more pieces of equipment to make the machine run.

Besides the system unit and keyboard, here's the minimum configuration you need: 256K memory, one disk drive, a disk controller, a monochrome monitor, and a monochrome adapter. To use a printer, you need a parallel port.

Ideally, you want two disk drives and 512K or 640K of memory. That configuration will allow you to run more high-powered software more easily. Also, with some systems you can add memory directly to the motherboard; on others, you need to use an expansion card and take up a valuable expansion slot.

Video Display. Subtleties about the video displays on IBM compatibles will affect your ability to run certain programs. There are four main types of video adapters: monochrome text, monochrome graphics, color graphics, and enhanced color graphics.

For straight text and/or numbers work, all you need is the text adapter; but if you want to use software that generates graphics or charts, you'll need either the monochrome or color graphics adapter. Most games and educational programs require the color graphics adapter and a color monitor. Only advanced graphics/charting programs and desktop-publishing programs require the enhanced graphics adapter. And then you also need a monitor that can display the enhanced colors!

Even if you buy a computer with built-in monochrome and color graphics adapters, you won't be able to run most color software unless you have a color monitor (or a special monochrome monitor). By contrast, on the Commodore 64, Apple II, and Atari XE, you can run color software on a monochrome monitor.

Power Supply. Most IBM-compatibles can be bought with one floppy disk drive and one hard-disk drive; alternatively, you can add a hard-disk drive later. However, to do so, you should have at least a 130-watt power supply.

Speed. While the stock IBM PC includes a microprocessor that runs at 4.77 MHz, several of the compatibles use processors running between 6 and 8 MHz. The extra speed is a potential advantage, especially if you work with large files, as long as it is easy to switch from the higher to the lower speed. If not, you may find compatibility problems with certain software and hardware combinations.

—NICK SULLIVAN

COMPATIBILITY

Compatibility was once a hot topic in selecting a PC, and there are still a few isolated spots where you might run into trouble. However, with the mid-priced machines listed here, virtually any program that runs on an IBM PC will run (except for a handful of educational programs written in BASIC).

In addition, manufacturers of graphic cards, peripheral devices, and other hardware add-ons will go out of their way to make sure their products work with major-brand compatibles. Hardware compatibility is still not foolproof, but you can be sure that while every add-on may not work with every compatible, there is hardware readily available to expand any of the systems listed here. For instance, the Tandy 1000 EX and Epson Equity I require boards from Tandy and Epson, respectively, but both companies offer a wide range.

WHO SHOULD BUY

The mid-priced brand-name compatibles blend reasonable price with high-quality construction and good service. The size of the companies makes reliability and support less of a problem than it is for a no-name clone. Because the computers are distributed through retail

IBM PC/XT COMPATIBLES

Model Company Phone	Price	Standard Memory[1]	Disk Drives (Built In)	Ports[2] (Built in)	Expansion Slots[3]	Monitor/ Adapters (included)	Processor Speed	Power Supply (Watts)	Software Included	Warranty (Months)
LOW-COST NO-NAMES										
Advanced PC/XT Advanced Computer Products (714) 558-8813	$699	256K	Two	P,S	3	Monochrome monitor; c/g	4.77/8	100	None	3
ACS-Turbo ACS (818) 889-1092	$799	640K	Two	P	8	Monochrome monitor; m/g	4.77/8	150	MS-DOS 3.1, *Homebase*	12
Bentley Model T Bentley Computer Products (512) 250-9897	$395	256K	One	None	8	None	4.77/8	150	None	12
Blue Chip Personal Computer Blue Chip Electronics, Inc. (602) 961-1485	$699	512K	One	P,S	6	m/g and c/g	4.77	130	MS-DOS 2.1	12
Franklin PC-8000 Franklin Computer (609) 488-0600	$999	512K	Two	P,S	4	c/g	4.77	67	MS-DOS 3.1	3
ITS Turbo XT Information and Technology Services (703) 847-4740	$895	640K	Two	P	8	m/g	4.77/7.33	135	MS-DOS 3.1	12
Turbo PC PC Limited (512) 339-6800	$795	640K	One	None	8	None	4.77/6.66	130	None	12
Tech Turbo PC/XT Tech Personal Computers, Inc. (714) 385-1711	$829	640K	One	P	8	Monochrome monitor; m/g	4.77/8	135	None	12
Technoland PC Technoland Inc. (213) 724-2781	$859	640K	One	None	8	None	4.77/7.4	135	MS-DOS 3.1	18
The PC Plus Thompson, Harriman and Edwards Computer Products Co. Ltd. (312) 280-0002	$507	640K	One	None	8	None	4.77/8	135	None	12
A*III Wells American Corp. (803) 796-7800	$995	512K	One	G,P,2S	8	None	6/8	220	None	3
MID-PRICED BRANDS										
Epson Equity II Epson America, Inc. (213) 373-9511	$1,695	640K	One	P,S	5	Monochrome monitor; m/g	4.77/7.16	100	MS-DOS 3.1, GW-BASIC	12
Kaypro PC Kaypro Corp. (619) 481-4300	$1,595	768K	Two	P,S	9	Monochrome monitor; m/g and c/g	4.77/8	132	MS-DOS 3.2, GW-BASIC, *Mite, PolyWindows, WordStar series*	12
Leading Edge Model "D" Leading Edge Products (800) USA-LEAD	$1,295	512K	Two	P,S	4	Monochrome monitor; m/g and c/g	4.77/7.16	130	MS-DOS 3.1, GW-BASIC *Leading Edge Word Processing*	15
Tandy 1000 SX Radio Shack/Tandy Corp. (817) 390-3700	$999	384K	Two	P,G	5	m/g and c/g	4.77/7.16	67	MS-DOS 2.11, GW-BASIC, *DeskMate II*	3
Tandy 1000 EX Radio Shack/Tandy Corp. (817) 390-3700	$599	256K	One	P,G	3 with Plus exp. board	m/g and c/g	4.77/7.16	28	MS-DOS 2.11, GW-BASIC, *Personal DeskMate*	3
PREMIUM-PRICED BRANDS										
AT&T 6300 AT&T (201) 221-4191	$2,820	640K	Two	P,S	7	m/g and c/g	6	165	None	3
Compaq Deskpro Model 2 Compaq (713) 370-7040	$2,399	256K	Two	P,S	6	m/g	4.77/7.16	160	MS-DOS 2.1, GW-BASIC	3
ComputerLand BC88 ComputerLand (415) 487-5000	$1,495	256K	None	P,S	8	None	4.77/8	155	MS-DOS 2.11, GW-BASIC	3
IBM Personal Computer IBM Corporation (800) 447-4700	$1,595	256K	Two	G,P,S	5	None	4.77	130	GW-BASIC	3
Z-158 PC Desktop System Zenith Data Systems (312) 699-4800	$2,199	256K	Two	P,S	5	None	5/8	168	MS-DOS 3.1	12

[1]Memory can be expanded to 640K or more. [2]Game (G), Parallel (P), and Serial (S). [3]Some slots may be taken up with interfaces and video adapters.

stores, you can take the computer out for a "test drive" before buying it. If you want an inexpensive MS-DOS machine but can't afford to take a chance on what might prove to be a "disposable" computer, the brands in this category are solid choices.

PREMIUM-PRICED BRAND NAMES

When the IBM PC was introduced in 1981, the bare-bones system (with 48K and one disk drive) cost over $2,000. Everything else was extra—a monitor, PC-DOS, more memory, the works. A complete system was a very expensive proposition at the time (and certainly by current standards), and was bought primarily by large companies or people who ran small businesses.

Because the IBM PC sold so well, other manufacturers jumped into the fray. Compaq was the first company to successfully market an IBM compatible because its portable was the first computer that was virtually 100 percent compatible and it cost considerably less than an IBM PC. Compaq also sold primarily to people in business.

AT&T, Zenith, ITT, and others started making IBM-compatible computers to sell to other big companies. In 1986, the national ComputerLand chain began offering its own computer system, which begins as a virtual "empty box" and allows users to pick and choose components for a custom system.

As PCs become more of a commodity and prices collapse, the range between a machine built by IBM and a no-name clone is narrowing daily. Turning to more profitable markets, high-end manufacturers have turned their sights to AT-compatible computers and the next generation "386" machines that use Intel's 80386 microprocessor. Trade sources report that IBM is coming out with new PCs for the home and school markets with high-resolution color displays that will give them a momentary edge over compatibles.

PRICE

Though high-end IBM compatibles are still considerably more expensive than the clones, you can find deals here and there. For instance, 47th St. Computer in New York City, one of the country's largest mail-order vendors, was recently selling an AT&T 6300 with a color monitor and two disk drives for $1,599, considerably lower than its official list price.

However, if you are shopping for a machine in this category, be advised that the advertised price often doesn't include integral pieces. For instance, IBM PCs are usually sold without a display adapter, so you can't connect a monitor. And sometimes they are sold without a floppy drive controller. By the time you assemble a working system, the price has soared.

Also, you should know that you're not necessarily getting different components than you would from a no-name clone maker. The box may say IBM or AT&T, but dealers often use boards and disk drives from other manufacturers. Many so-called IBM PCs sold today use many of the same parts you'll find in lower-cost compatibles. There is nothing intrinsically wrong with this, especially since you are assured of good service in case of trouble. But, paying top dollar doesn't necessarily mean you're getting a better machine.

The main payback when buying a premium-priced IBM compatible is assurance that all third-party add-ons will work with it. Manufacturers of graphics boards, memory expansion, modems, etc., will make sure that their products run on the big-name computers first. While the compatibility question is pretty unimportant today for run-of-the-mill software and hardware, more specialized applications sometimes cause problems.

Another consideration in terms of compatibility is the instruction provided for installing various hardware devices. You can rest assured that any add-on board or disk drive you purchase will come with directions for installing them in an IBM PC, but for compatibles you may be left to your own devices.

WARRANTY AND SERVICE

When you pay top dollar, you can be assured of getting a well-built workhorse. The keyboards are sturdy and the system units solid. You can anticipate fewer potential problems than with a no-name clone. In addition, many dealers sell service contracts for the high-end computers and will replace them with other machines when repairs are being made. Thus, if you can't afford to be without a computer for any length of time, you may want to pay a little extra for security.

Many outfits that provide on-site or carry-in service won't touch a clone, but they are happy to work on IBMs, even if they have non-IBM boards in them.

WHO SHOULD BUY

Buying a corporate-level compatible is advantageous, primarily on two counts—compatibility and serviceability. The compatibility issue is largely a question of your expected use of the machine, since only fairly esoteric peripherals will fail to run on lower-cost compatibles. The service question is more a matter of availability than of quality. It is not the case that IBM or Compaq does a better job of servicing their machines; rather, anyone who fixes PCs will have the parts and the information needed to do the job.

The premium-priced category makes sense for heavy business users who need quick service in case of breakdowns, or people who don't care to spend the time trekking through the swampy jungle of Brand Xs, Ys, and Zs.

—STEVE MORGENSTERN

PC? XT? AT?

IBM personal computers come in three basic flavors (and many variations), as do compatibles, and it's important to understand the difference when you go shopping. In this article and in the accompanying chart, we've concentrated on PCs and XTs, though most manufacturers also sell high-end AT versions. At press time, trade sources are saying that IBM is planning a new version of its PC, with high-resolution color graphics and other new features. However, in this article we are discussing only the "old-fashioned" PC.

The basic IBM PC and the XT use the same microprocessor (the Intel 8088) and the same software. There are two key differences—the XT has more expansion slots (eight versus five), and has a larger power supply (130 watts versus 63.5 watts) to accommodate a hard disk. Nowadays, almost all compatibles are more like an XT than a PC.

In the past, XTs were usually sold with a hard-disk drive installed, but that's not always the case now. At the same time, many compatibles that include a larger power supply do not have the XT designation on their name. Look at the product specs carefully to understand what you're getting.

The IBM PC/AT has a different microprocessor (the Intel 80286), which is compatible with the earlier chip but runs at a higher speed and is more powerful. While this is desirable for number-crunching applications, there is still very little software that requires an AT to run. In addition, the AT is sold with a high-capacity floppy disk (1.2 megabytes of storage), and often with a 30-megabyte hard-disk drive. All around, it's designed for large-scale business tasks.

Finally, IBM recently introduced a cross between the XT and AT called the XT/286. It's an XT that uses the faster 80286 microprocessor.

GUIDE TO WRITING WITH COMPUTERS: PART 8

Which Computers Make the Best Word Processors?

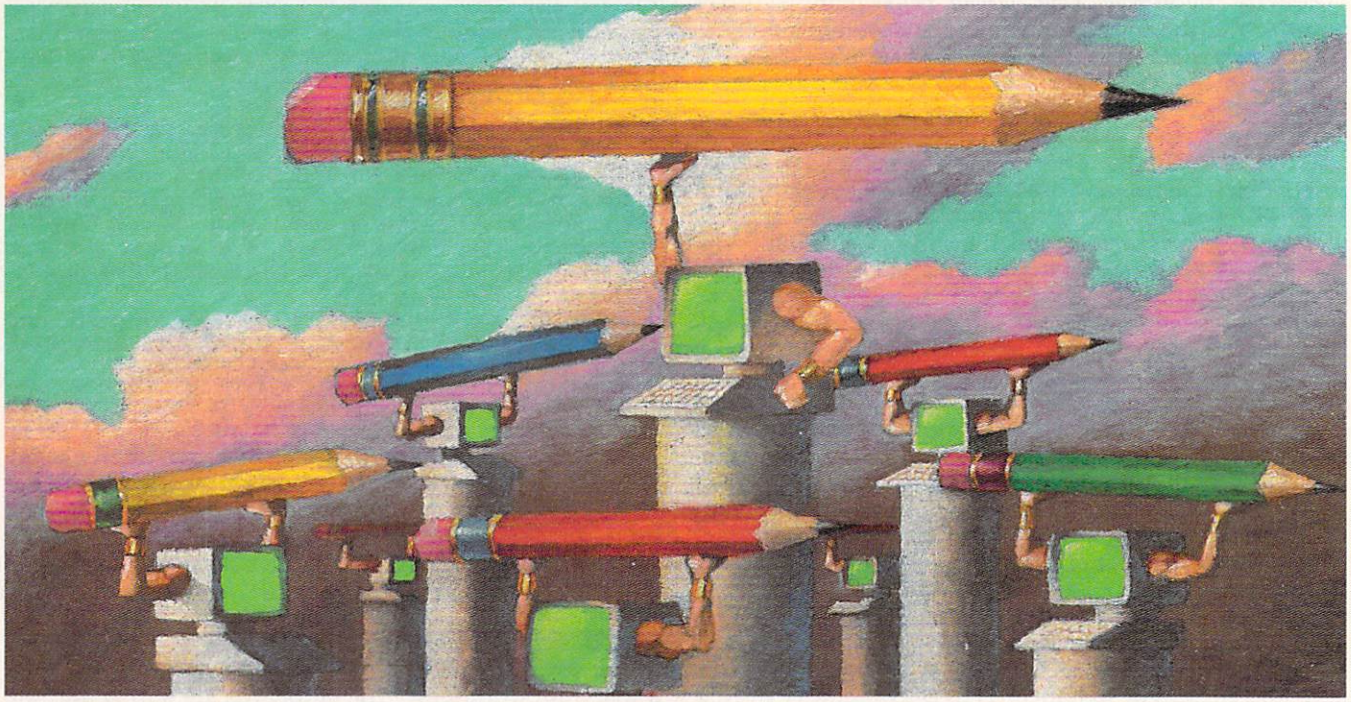


ILLUSTRATION BY DARRYL LIGASAN

RATING THE MOST POPULAR MACHINES

BY DAVID HALLERMAN

I should have known better. All the danger signals were clear. As Graeme W. McRae, an IBM PC user from Monmouth Junction, New Jersey, cautioned, "You've asked a question similar to 'What's your religion?' and 'Why is it better than the other guy's religion?'" Even though his words alerted me to the potential for strife, I went on. I was determined to try to rate different computers as word processors.

CHOOSING A COMPUTER FOR WRITING

What if you're figuring out which computer to buy for word processing? It's not an easy decision; I've seen friends agonize for two or three years about which machine to get. Even those convinced that a computer is a better tool for writing than a pen or a typewriter often share the attitude stated by one computer user I correspond with: "Most computers seem roughly equal for writing; it's the software that varies."

While there's truth in that statement, it doesn't go far enough. Of course, without good software for word processing, even the most sophisticated computer is not much of a writing tool. Yet a computer's hardware and operating system can either help or hinder the potential ease of word processing.

HOW THESE COMPUTER RATINGS WERE DETERMINED

In comparing computers for word processing, we'll refer to a "basic system," which is defined for this article as the computer, a monochrome monitor (generally better for word processing than color), and one drive (or two drives when that configuration is more common, as with an IBM PC or compatible). While a printer is certainly needed to complete a writing system, it is not included in our basic comparisons since its cost can vary so greatly, anywhere from about $100 to thousands of dollars.

As we rate these popular computer systems, you'll find grades of Good, Very Good, and, potentially, Excellent. To rate no computer as less than good for word processing is confirmed by experience. After a short time working with one, people tend to feel that any computer is better for writing than none. As Jim Jordan, of Bay Shore, New

DAVID HALLERMAN *is reviews editor for* FAMILY COMPUTING.

York, observed, "Whenever I'm tempted to curse at the computer, I just think back to the days when I had to write with a typewriter (or, heaven forbid, pencil and paper!), and use white-out, and get extra copies with carbon paper or copying machines. Anything is better than that!"

WHAT MAKES A GOOD WRITING TOOL?

Keep the following attributes in mind when shopping for a computer that will be used mainly for writing.

Memory. The amount of memory in a computer (RAM) helps determine several factors. For example, the more memory, the larger your documents can be. For some people, 64K is enough RAM, giving you space for about 10 to 15 pages (maximum)—but there are reasons to want more. More RAM means the computer has room for both lengthy text and the word-processing program itself. Greater amounts of memory accommodate word processors with extra features and that are easier to use. Speed of operation is another factor largely determined by memory; while not all programs load entirely into memory (even when there's plenty), those that *do* run more rapidly than those that have to read the disk drive periodically. Finally, if you want to use a spell-checker or a thesaurus while you're typing rather than after you're finished, greater memory helps make that possible. How much memory is enough? As much as you can afford and as much as your computer and software can use. A minimum of 128K RAM is a good starting point for many writers.

80-column display. There's no question that an 80-column display is better for writing than only 40. Why limit your view, especially when you're writing? That's why computers that offer only 40 characters per line of text are not prime candidates for word processing, except for those who prefer larger letters that are easier to read. (Unless otherwise noted, all the computers rated offer 80 columns.)

The keyboard. Since the keyboard is your main way of telling the computer what to do, all writers should be sure they like the way it feels, which is subjective. You also might want to consider computers with keyboards that have a number of function keys. These keys can make certain word-processing functions operate in a single keystroke. Here's still another keyboard consideration: Touch typists have taught their fingers to get used to certain keys in particular positions. If you have a tough time adopting new habits, a keyboard that doesn't violate this standard layout makes most sense.

Value. A low price is not the same as a good value. For example, it probably makes less sense for you to spend about $400 for a system with writing limitations (such as the C 64, with only 64K of memory and a 40-column display) than it does to increase your costs by 50 percent and spend $600 for a 512K Atari ST. (For the purposes of this article, we're assuming that the bulk of your time will be spent writing.) Is it a good value to purchase an IBM PC system for $1,250 when a no-name IBM PC clone is priced at $750? Maybe, if part of the extra cost means a better keyboard or support when you need it. (NOTE: *All prices quoted in this story are based on recent print advertisements.*)

Efficiency and ease of use. A computer's disk operating system (DOS) affects everything you do with that computer. At its best, a computer does not make you think about the mechanism that's taking down the words; it simply lets you write. But some operating systems, like Commodore DOS or MS-DOS, are especially hard to learn and operate and can interfere with the flow of writing. Contrast MS-DOS machines, say, to the relative ease of the Macintosh, Amiga, and Atari ST, which use a mouse to manipulate the computer screen and familiar icons to represent functions. But be aware of the trade-off. Even some people who *like* one of those three computers may not like "mousing" around when writing. But many others love (or at least are not bothered by) a mouse, so try one out before buying one of these mouse-based machines.

Printer support. Some types of computers restrict your choice of compatible printers more than others. For instance, the C 64 and C 128 need a printer with interfaces designed just for those machines—unless you buy a special adapter. The Macintosh, for all its ease of use, is a difficult computer to set up for use with a daisywheel printer.

Available word processors. What word processors are available for the computer? How large and how good is the selection? The software (not the hardware) is still at the heart of writing with a computer, but all software reflects the computer on which it's running. There are more trade-offs. To a greater or lesser extent (indicating a lesser or greater program), the more power a program gives you, the more complex that program is.

In coming to a decision, make a list of the "Pros" and "Cons." We've begun that process for you in the following sections by delineating the strengths and limitations of various computer systems for word processing.

AMIGA

Strengths: Mouse-and-icon interface for ease of use. The keyboard has a good layout and decent feel. The excellent graphics give the potential for "what you see is what you get" (WYSIWYG) word processors. Lots of memory (256K), with room for expansion.

Limitations: Mouse-driven operating system, which makes touch typists take their hands off the keyboard. There are few available word processors, none of which is powerful.

Rating: Good, with promises of Very Good. Someday, the quality of word-processing software available for the Amiga will match the computer's large memory, fast microprocessor, and graphic strengths.

APPLE IIe/IIc

Strengths: Good keyboard layout. Many extremely capable word processors. A wide choice of printers work with them (especially the IIe). 128K memory is standard.

Limitations: The cost for a basic system is more than for an Atari ST and many IBM PC compatibles, and the Apple IIe and IIc are priced not much lower than the sibling Macintosh. Documents longer than about 30 pages need more than the standard 128K, and, even with extra memory, most word processors don't use it. Some writers dislike the closely spaced keys on the Apple IIc keyboard.

Rating: Good to Very Good. As advanced word processors are developed for the newer, more powerful IIGS, this line could rate Very Good.

ATARI 800 XL/XE

Strengths: A fine value. As Bill Wilkinson, of OSS (Optimized Systems Software) in San Jose, California, and publisher of *The Writer's Tool* word processor for the Atari, said, "There are undoubtedly better systems, but I doubt there are better ones for the price." Many printers will work, since the computers use a standard parallel interface if you buy a converter.

Limitations: Although devoted users (as well as C 64 and CoCo owners) might disagree vociferously, even one online Atari fan had to use the word "unfortunately" when describing the Atari's lack of an 80-column display. You could ask for more memory than 64K, too, but you won't get it (except for use as a RAM disk).

Rating: Good on features and Very Good for value. Price is a big factor here, with a basic system going for around $350 to $400.

ATARI ST

Strengths: Matthew Stern, a frequent contributor to FAMILY COMPUTING, likes the ST for writing because it uses a standard keyboard layout and for its memory (512K) and speed. "I can scroll through documents and make changes quickly," he said, "without waiting for the screen to redraw." He also likes the mouse-and-icon interface for ease of use and appreciates how rapidly the drives save and retrieve even his longest documents.

Limitations: Someday, not too long from now, the ST will boast word-processing software as powerful as the hardware. But as this is being written, only mid-level word processors are available.

Rating: Good, growing to Very Good. On a cost basis, the Atari ST is a big winner. We've seen ads for a basic monochrome 520ST system for less than $500.

COMMODORE 64/128

Strengths: Not only does the C 128 deliver more than the C 64—twice the memory and an 80-column display—it can also run such classic word processors as *WordStar*, since the C 128 supports the venerable CP/M operating system. While you'll probably have to search to find CP/M word-processing programs (luckily, the C 128 borrowed the CP/M format used by the once-popular Kaypro II), the extra power may well be worth the effort.

Limitations: Unless a programmer does tricks with the graphics mode, you're limited to a 40-column display with a C 64. (Even with tricks, 80 columns on the C 64 may not be the most readable.) As for the C 128, 80-column display on an RGB isn't the clearest. And with both machines, the disk drive is abysmally slow when you save or retrieve text; that's a fault of the operating system. Also, there's a nonstandard keyboard and a limited choice of printers that don't need special adapters.

Rating: C 64: Good on features and Very Good for value. Prices are comparable to the eight-bit Ataris. C 128: Very Good on features and Good for value. Features are comparable to the Apple IIc.

IBM PC & COMPATIBLES

Strengths: Easily expanded to 640K memory. Wide range of quality word processors for everyone from novices to experts. Rock-solid 80-column display in monochrome. Most printers work with IBM PC & compatibles. Low-cost compatibles have brought the prices down to fit into many families' budgets.

Limitations: MS-DOS, MS-DOS, MS-DOS. The difficulty with this notorious operating system has led to a cottage industry in books just to explain it. When MS-DOS takes on the same mouse-driven guise as the Macintosh, for example (as with *Microsoft Windows*), it slows down considerably. Be aware of the keyboard's configuration; with the original IBM PC and certain clones, some keys (such as the left SHIFT key) vary from their usual placement.

Rating: Very Good, but not quite Excellent. The limitations imposed by MS-DOS preclude excellence.

MACINTOSH

Strengths: With its slew of fonts and graphics orientation, the Mac is the apotheosis of "what you see is what you get" on a personal computer. Easy to operate, coupled with enough memory (512K minimum) for fairly large documents. Some powerful word processors, too—especially *Microsoft Word*.

Limitations: Speed is not one of the Mac's strongest points; it can slow down during certain operations, such as reformatting text or saving and retrieving files. The 512K Mac keyboard has no arrow keys to move the cursor. Some writers find the mouse cumbersome. You're limited in compatible printers.

Rating: Very Good, verging on Excellent (with reservations). Why the reservations? Fewer alternatives in word-processing packages than, for example, the IBM PC world or the Apple II line. Fewer printer alternatives, too. But prices have dropped enough to make it an exceptional value.

THE ENVELOPE, PLEASE. THE WINNER IS . . .

When you look at all the factors, the winner is . . . anybody who writes with a computer instead of a typewriter, ballpoint, goose quill, or other writing tool.

Are you disappointed that there's no clear-cut winner? On the contrary, it should make you happy to know that there are so many acceptable word-processing choices, and many that are much more than merely acceptable.

It's funny, though—when people like their word processors, they often see few (if any) weaknesses. Yet, when you look at what's technologically possible, there are no excellent computers for word processing. Lance Paavola, FAMILY COMPUTING's technical director, wants a computer that displays a whole page at a time, and I would like to write correspondence by talking into the computer. While found in high-end systems, such capabilities are not yet affordable for most computer owners. Compared to what we can imagine, an *excellent* computer system for writing has yet to hit the market. FC

THE EIGHT-PART SERIES

This is the final part of eight in the series, "The Guide to Writing with Computers." Here's an outline of the series in the order in which the articles appeared.

Part 1 (August 1986): "Finding the Right Word Processor." Take our quiz, tally your score, and check the chart to find the right program for your needs.

Part 2 (September 1986): "Add Power and Precision to Your Prose." Spell-checkers, thesauruses, grammar checkers, and outlining programs.

Part 3 (October 1986): "Search and Replace Makes Writing Easier." Examining a dynamic, time- and error-saving duo.

Part 4 (November 1986): "Headers, Footers, and Footnotes." Learn how to spruce up your printouts.

Part 5 (December 1986): "Writing Shortcuts." Save time, increase accuracy, and end drudgery with word-processing macros.

Part 6 (January 1987): "Learn to Control Your Printer." Make your printouts look exactly like you want them to.

Part 7 (February 1987): "Word Processors: The Ultimate Team Players." Learn how communications, data-base, and spreadsheet programs can jazz up your writing.

Part 8 (March 1987): "Which Computers Make the Best Word Processors?" Rating the most popular machines.

If you're missing back issues and want to catch up, send a note indicating which month(s) you want and a check for $3.95 per copy ($2.95 each for five or more) to: Back Issues, c/o FAMILY COMPUTING, P.O. Box 717, Cooper Station, New York, NY 10276-0717.

Guide to Computer Repair

WHAT CAN YOU DO? CAN YOU FIX IT YOURSELF? WHERE DO YOU GO? WHAT COULD BE WRONG? WHO SHOULD YOU HOLLER FOR?

BY LINDA WILLIAMS

Finally, Lois Gilman thought, the end is in sight. After two years of work on a book, she was ready to print out her hefty manuscript and deliver it to her editor. Exhausted and relieved, Lois activated her printer to churn out the eight disks worth of material—and realized something was wrong; her printer typed away but no characters appeared on the page.

Frantic, she tried calling the manufacturer of the Daisywriter printer, Computers International, but learned that the company had gone out of business. Lois then rummaged through her receipts and documentation and found the name of the firm that had distributed the printer to her store. She called, only to hear that they didn't handle that printer any more.

"It was one of the more frustrating experiences of my life," Lois says. "I was at an impasse. I had about 10 hours of printing to do." Nearing desperation, she learned of a third-party company that could repair her almost-extinct printer. Lois carted the IBM Selectric-size printer off to a local Honeywell service center, and by the next day, a repairperson had "made an adjustment." She shelled out in the neighborhood of $40 and took home her newly fixed (or so she thought) printer. When Lois tried it, she saw that only partial letters would print out. She took the machine back and she waited while the repairperson made some additional adjustments with pliers. She returned home once again and characters still weren't printing out the right way, so she called Honeywell and said, "We're coming back."

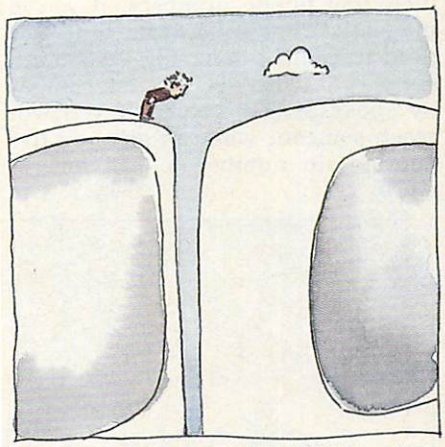
Before making the third trip, though, Lois decided to try something herself; she replaced the IBM printer ribbon—made by a company other than IBM—with a ribbon made by IBM. Holding her breath, she tried printing out her book manuscript one more time, and, voilà, the printer began churning out perfect-looking characters.

LINDA WILLIAMS *wrote "The ABCs of Computer Care and Maintenance" in the February issue.*

LOOK BEFORE YOU LEAP

At one time or another, many computer owners waste time and throw away money on unnecessary repairs. Lois spent a week and $40 and took time off from her job to solve her minor printer problem. The bills are expensive reminders of the value of preventive maintenance and thinking before panicking. Checking the following possibilities before you call a repair team could save you money and embarrassment.

- It sounds basic, but make sure the computer, monitor, and printer are turned on. Also, be sure to check the monitor and printer controls. For example, if your monitor's brightness is turned way down, your monitor may appear to be "dead."
- Figure out which computer component is giving you trouble. Is it the disk drive, the printer, or the monitor that doesn't work? Through a process of elimination, you can narrow down the problem. This will make it possible to solve the problem yourself or to lead a repairperson to the source of trouble.
- Make sure all cables and power cords are attached securely.
- Try rebooting the system.
- If the printer malfunctions, check the paper supply, make sure the printer is on-line, and examine the printer ribbon. Your printer may stop working when it reaches the end of the printer ribbon, or the ribbon may be jammed or misthreaded. You should also make sure your printer's DIP switch settings are correct. (You can find out more about DIP switch settings in your printer manual.)
- If you're using a television instead of a monitor, make sure the television is tuned and set to the correct channel.
- Are your disks inserted correctly? Make sure the proper disks are in the appropriate drives, with the doors closed. Another surprisingly common error is inserting the disks upside down or backward.



GO BACK TO THE SOURCE

There was a time when, if your computer ailed, you could call the manufacturer's toll-free number and get free advice from an expert technician. Unfortunately, most companies have stopped paying for these phone lines. You can still get the advice from a number of computer manufacturers, though now on your nickel—not theirs.

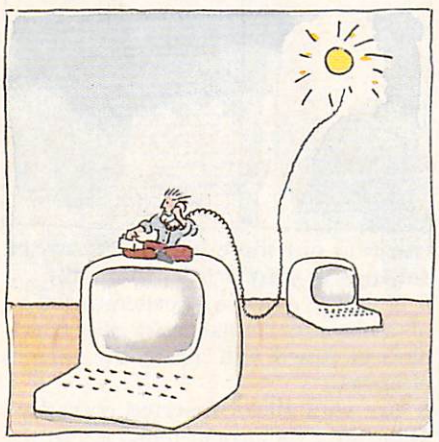
Apple still maintains a toll-free number, which is a referral to dealers. By calling (800) 538-9696, you can get the phone number of a nearby authorized dealer. If the dealer can't solve your problem, he or she can ask questions of an Apple support technician via electronic mail or the phone. Calling Apple's customer-relations number (408) 973-2222) will put you in touch with a representative who can also help you with your questions or find someone else

ILLUSTRATIONS BY MONA MARK

who can help.

Atari owners with computer problems or questions can call the customer-relations number, (408) 745-2367. Representatives will tell you how to send in your machine for repair or, if you prefer, refer you to a nearby authorized service center. They will also let you speak with technicians, in the hopes of helping you solve the problem yourself. Atari doesn't actually repair machines; it replaces faulty components.

Commodore equipment comes boxed with a list of local service centers, including phone numbers. If you've misplaced that list by the time you need it, call the company's customer support at (415) 436-4200. A company spokesperson says that you will reach someone who can give you the appropriate number to call for repairs.



IBM owners, until last summer, could turn to one of the company's 84 product centers for advice and repair. Now NYNEX owns 81 of the centers and calls them NYNEX Business Centers. These retail outlets still service IBMs and other machines (such as Compaq and Apple Macintosh).

Tandy owners can go to one of the 500 Radio Shack computer centers nationwide. Just call or carry your machine in, and someone will help you out. That is, so long as the components come from Tandy/Radio Shack. These centers will not touch third-party brands.

THIRD-PARTY DOESN'T MEAN THIRD-RATE

It isn't unusual for a dealer to refuse to service competing brands, which can be a problem if you have a hybrid system, that is, a computer system with components from more than one manufacturer. Instead of contacting Tandy (and paying!) to see if the problem is in your CPU, and then calling Toshiba to see if it's in your printer, you can make one call

to a third-party repair place. In addition to the convenience, the service is almost always 30 to 50 percent less expensive.

The third-party repair industry has undergone enormous growth and is now a billion-dollar-a-year business. About 70 percent of the computer maintenance market belongs to 10 or 12 firms, including TRW, Sorbus, Control Data, Honeywell, and RCA. While much of this business goes to corporate accounts, several firms cater to families with computers at home. The Computer Doctor, for example, services Apples, Commodores, Compaqs, IBMs, Kaypros, and Leading Edges. Computer Doctor's house calls cost $100 for the first hour plus parts; in-store service costs $75 for the first hour plus price of parts.

Some cautious computer owners are wary of the quality of third-party repair. Consider, though, that the "big guys" often turn to third-party places when they can't handle the volume or can't service an off brand. Even if you consciously stick to the big-name shops, you may be getting third-party service. Kirk Etter, owner of Micro Medics in Morton Grove, Illinois, claims that 80 percent of his business is for computer stores. And you better believe those stores don't pass on the cheaper, third-party rates to you.

WE ALL NEED SOMEBODY TO LEAN ON

Whenever you run into computing problems—whether it's a dark monitor, motionless disk drive, or a printless printout—there are a number of places to turn for help *before* you pack up your ailing machine and rush back to the computer store, manufacturer, or third-party repair shop. Try the following:

Users' groups. An excellent source for technical information, users' groups generally provide monthly meetings, newsletters, bulletin boards, workshops and training sessions, and phone numbers of experts in the group. They are inexpensive to join and may save you bundles in the future. Your computer's manufacturer may know of users' groups in your area.

Apple users' groups are independent of the manufacturer. Nevertheless, Apple will guide you to one in your area: Call (800) 538-9696 and ask for extension 500.

Atari boasts some 600 users' groups and keeps a list in the customer-relations department. To find one near you, call Atari at (408) 745-2012.

Commodore representatives coordinate their users' groups. For more information, write to Pete Baczor, Users' Groups Coordinator; Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380.

IBM owners can find information about IBM users' groups at the NYNEX Business Centers (formerly IBM Product Centers) and at ComputerLand. One large one, the New York PC Users' Group, maintains a hotline ([212] 533-NYPC), as well as a bulletin-board number ([212] 697-1809).

Tandy owners can get more information about Tandy users' groups at the nearest Radio Shack Computer Center. Tandy Corp. doesn't maintain a master list.

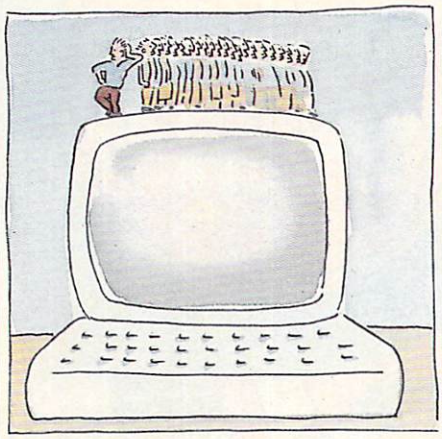
And finally, check local computer stores for information on new, small, or multibrand users' groups not listed by the manufacturer.

On-line services. If you don't have the time for club meetings, you may be able to get electronic guidance. Both CompuServe Information Service and The Source offer sections for specific computers, where you can speak with experts (electronically) about your computer problem. To become a subscriber to the service or for more information, contact CompuServe, 5000 Arlington Centre Blvd., Columbus, OH 43220; (800) 848-8199; or The Source, 1616 Anderson Road, McLean, VA 22102; (800) 336-3366; or (703) 734-7500.

Bulletin boards. Another electronic alternative is a bulletin board, where users post and read messages. Most avid computerists love to share their hints, advice, and caveats. The Source and CompuServe have listings of their own bulletin boards (searchable by state and area code). You might consider a subscription to *Bulletin Board Systems*, which is published eight times a year for $26.50 by Meckler Publishing Inc., 11 Ferry Lane, Westport, CT 06880.

Neighborhood whiz kids and adults.

Often, help is no farther than your own backyard. Who knows? Your children's computer-expert friend may be able to help you out with a problem. Or better yet, call that computer lovin' friend of yours who convinced you to buy a computer in the first place.



Books and magazines. Of course, FAMILY COMPUTING is a good source for computer information on all levels. And it's a good idea to keep several computing books within reach of your computer chair. Manuals for each component and piece of software should be right there, too. You'll be amazed at the nuggets of advice these guides offer.

Avoiding Computer Nightmares, by Howard Hillman (McGraw-Hill; $12.95; [609] 426-7600), gives you easy-to-understand instructions for care and maintenance in an enjoyable, light format.

The Care and Feeding of Your Personal Computer, by Robert Rafferty (Holt, Rinehart, and Winston; $9.70; [201] 648-6060), provides nuts and bolts advice about setting up a workplace, preventive care, and repair.

How to Use the Apple II and IIe Computer (also available for the Coleco Adam and the Macintosh) from The Dilithium Press ($7.95; [503] 243-3313) offers information about use, peripherals, and hints for maintenance and troubleshooting.

The Personal Computer Handbook, by Peter Rodwell (Barron's Educational Series; $16.95; [800] 645-3476), is an informative, practical guide to microcomputers. Its detailed diagrams will give you a rudimentary knowledge of how a computer works.

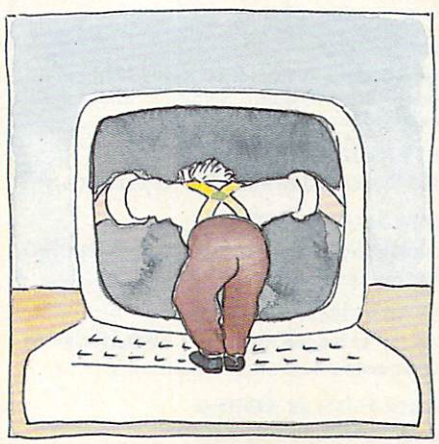
For more advanced users, take a look at *The Plain English Repair and Maintenance Guide for Home Computers* or *The Plain English Maintenance and Repair Guide for IBM Personal Computers* (Simon & Schuster; $14.95 each; [800] 624-0023 or [800] 624-0024 in New Jersey). The author of both, Henry F. Beechhold has a new book entitled *The Brady Guide to Microcomputer Troubleshooting and Maintenance* ($17.95), also by Simon & Schuster. Beechhold has also written six articles on the subject for FAMILY COMPUTING, which appeared in October 1985 and December 1985–April 1986.

SEEK AND YOU SHALL FIND

If you know how to look, you'll be able to isolate and solve most computer and peripheral problems. To do so, you'll have to master the art of troubleshooting—a combination of methodical testing and applying insight gained through experience. If you're a car owner, you probably troubleshoot to figure out what's wrong if, let's say, your car won't start. (Is it the battery, the starter, or maybe an empty gas tank?) As with car parts, it's important for you to understand the purpose and function of your computer's components so you can at least pinpoint the problem's source, if not solve it.

At the first sign of malfunction, turn off the system and all the components. Check that all of the cables and connectors are secure and jiggle them a bit. Pause for a moment and then turn the system back on. If that doesn't do the trick, make sure that all of your computer's circuit cards and internal connections are secure. (You can only do this if your machine has open architecture.)

A computer and printer may have built-in diagnostics that you can run. For example, the IBM PC and Compaq go through a self-test cycle every time you turn on the machine. Also, in the back of the IBM *Guide to Operations* manual, you'll find a diagnostic disk that contains further tests for your circuit boards and peripherals. Make note of any error messages and check the manual for their meanings.

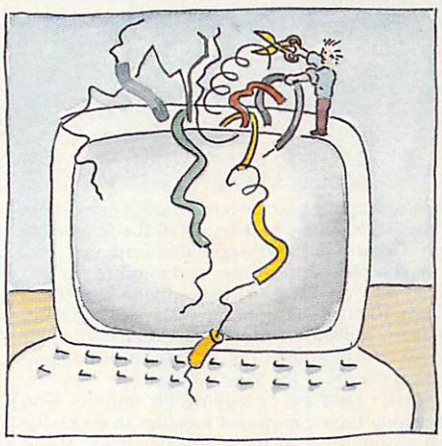


If you think you've located an ailing component, try substituting it with a working one. (It's a good idea to make note of which neighbors and business associates own the same components you do anyway, in case of an "emergency".)

It's simple to discern a misaligned disk drive. Disk-drive analyzer kits are available for most brands. Tandy, for example, manufactures one for its IBM compatibles for $29.95.

I'D RATHER DO IT MYSELF

You may feel comfortable enough to repair the machine yourself but proceed with caution. Remember that most breakdowns are not with the CPU or monitor, but with electromechanical components, such as the printer and disk drive. Here's something else you should be aware of: Taking apart and repairing your own machine may void your warranty. This means that if your machine needs any further repairs that you can't fix yourself, the manufacturer or dealer won't fix it either. (*See last month's "ABCs of Computer Care and Maintenance" for more on warranties.*)



A computer is a complicated and delicate piece of machinery that many people choose not to tinker with. How much you learn about the workings of your own machine and how much you leave in the hands of "experts" is up to you. Everyone is different. However, no matter how mechanically inept you claim to be, you should know where to turn when you need help, just as you should know when help isn't necessary at all. And you should always pay attention to your computer's unique sounds when it is working well: the bleep of start-up, the whir of the disk drive when it accesses information, or the horizontal motion of the print mechanism. If you know the healthy sounds, you'll be able to detect the "sick" ones. FC

ANNOUNCING THE THIRD ANNUAL COMPUTING FAMILY OF THE YEAR CONTEST.

Win One of 50 Prizes—More Than $5,000 Worth of Computer Systems, Hardware, Software, and Other Prizes to Be Given Away

Has your family found some winning uses for its computer? Yours could be one of the families to win a newly released Apple IIGS computer system, complete with printer and monitor. Or you could win an Okidata letter-quality printer, a Tandy 102 laptop computer, a Hayes 1200-baud modem, software, or one of dozens of other prizes in FAMILY COMPUTING's "Third Annual Computing Family of the Year Contest."

FAMILY COMPUTING is looking for families who are using their computers together in especially rewarding, unique, and/or efficient ways. If you don't think your own family is ready to be our "1987 Computing Family of the Year," nominate friends, relatives, or neighbors who are. Remember, of course, that, although there's only one Grand Prize, there will be lots of other prizes given away.

WHAT YOU NEED TO DO

Here are some of the questions we'd like you to answer. Put your story into essay form, with a maximum of 2,000 words.

- Why did your family buy a computer?
- Has your computer surpassed its original expectations? If so, how?
- How has it changed the lives of family members and how the family does things?
- How does each family member use the machine?
- How does the family use the computer together?
- Also, be sure to include the following information: 1) your name, address, and phone number; 2) computer and other hardware you own; 3) software packages you use most; 4) the month and year your family bought its computer(s); 5) the names and ages of all family members.

Entries will be judged by the FAMILY COMPUTING staff. It's not your technical expertise that's important to us. What is important is how you put your computer to use. The family whose essay the judges deem best—that is, the family who has made the greatest leaps and bounds with a computer—will become our "1987 Computing Family of the Year." Good luck!

GRAND PRIZE

Apple IIGS Computer System. Includes system (CPU), keyboard, mouse, 3.5-inch disk drive, RGB (color) monitor, and ImageWriter II printer. Suggested Retail: $2,500

FIRST PRIZE

Okidata Microline 293 Letter-Quality Printer. Suggested Retail: $949

SECOND PRIZE

Hayes Smartmodem 1200 and Smartcom II Software. Suggested Retail: $748

THIRD PRIZE

Tandy 102 Laptop Computer. Includes computer, printer cable, and modem cable. Suggested Retail: $534

FOURTH PRIZE

Home-Control System from X-10 (USA) Inc. Includes three modules, software, and cables. Suggested Retail: $115

FIFTH PRIZE: FOUR WINNERS

$100 Worth of Software and Accessories.

SIXTH PRIZE: SIX WINNERS

Subscription to Compuserve Information Service. Suggested Retail: $39.95

SEVENTH PRIZE: 15 WINNERS

New or Extended One-Year Subscription to FAMILY COMPUTING. Suggested Retail: $19.97

EIGHTH PRIZE: 20 WINNERS

FAMILY COMPUTING Tote Bag.

The Ofstehage family of South Dakota, our 1986 Computing Family of the Year.

CONTEST RULES

1. Deadline: Your entry must be postmarked by March 31, 1987.

2. Include a family photo and identify each member on the back.

3. Keep your entry shorter than eight double-spaced pages.

4. Scholastic Inc. employees, advisory board members, and members of their immediate families are not eligible.

5. Previous winners of the "Computing Family of the Year Contest" are not eligible.

6. Send nominating letters to Computing Family of the Year, FAMILY COMPUTING, Scholastic Inc., 730 Broadway, New York, NY 10003.

FAMILY COMPUTING

the Programmer

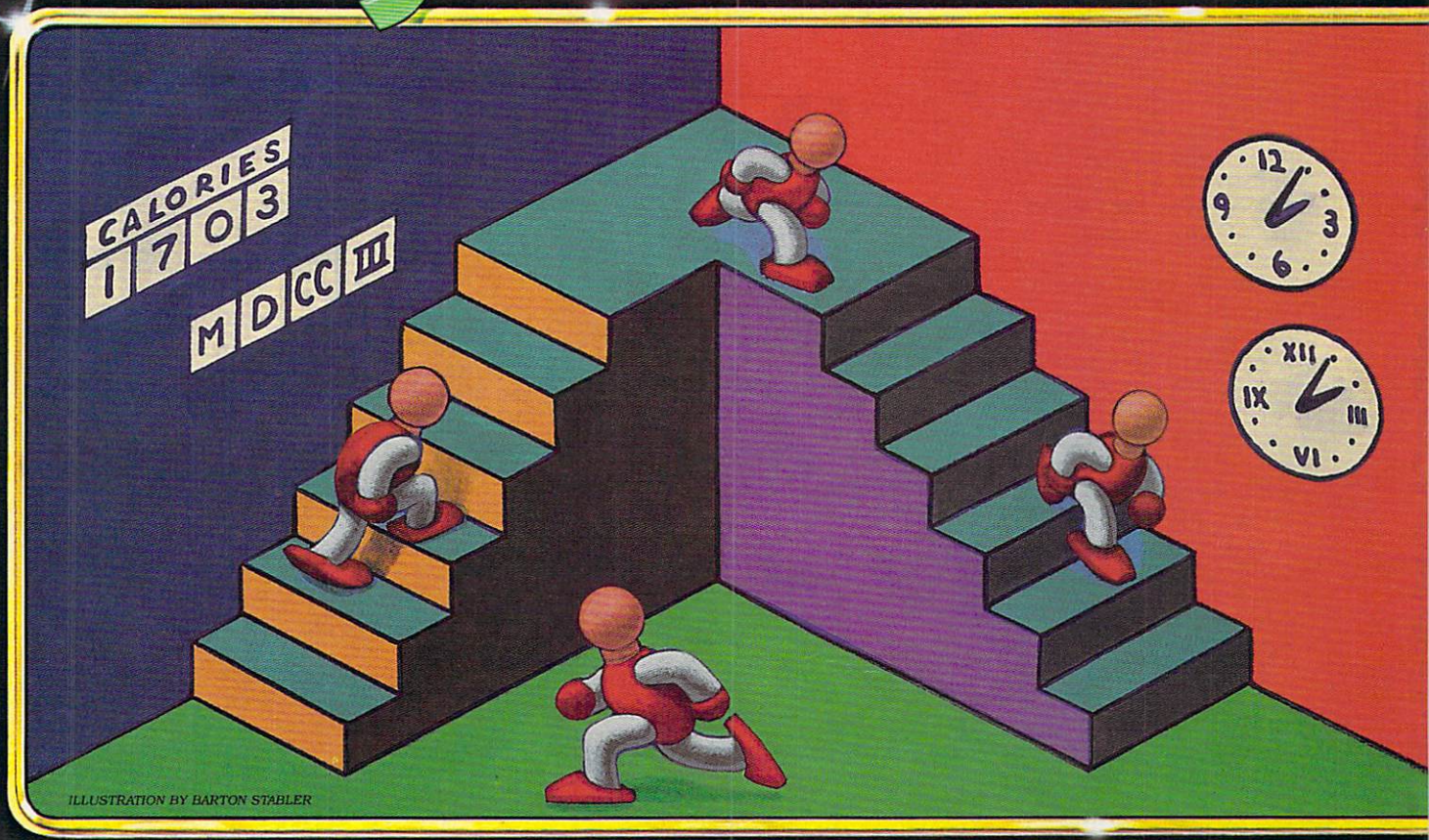


ILLUSTRATION BY BARTON STABLER

M A R C H

FUN LEARNING PROGRAM
Page 52
What do the word MIX and the number 1009 have in common? If you're not sure, type in the *Roman Numeral Converter* and find out.

SELF HELP PROGRAM
Page 60
Keep track of your diet and exercise plan with *Calorie Calculator*, a useful program that helps you balance calorie expenditure with calorie intake.

PROGRAMMING TUTORIAL
Page 69
If you would like to get more use out of your computer's function keys, follow our *Function Key Demo* and read the accompanying tutorial to learn how.

MORE PROGRAMS IN K-POWER
Page 80
Can Captain Quirk save the universe from the Stickons' scheme? Only the *Second Guesser* in Compucopia can say.

PROGRAMMING P.S.
Page 74
Corrections to previous months' programs.

ILLUSTRATION BY JAMES CHERRY III

ROMAN NUMERAL CONVERTER

HERE'S HELP IN DECIPHERING— AND DEVISING—ROMAN NUMERALS

BY JOEY LATIMER

One day, while I was watching some television movie credits roll by, the letters MCMLXXXI flashed on the screen. I thought I knew my Roman numerals, but I have to admit, I had trouble with this one. I was sure surprised when I fired up my *Roman Numeral Converter* program and discovered that MCMLXXXI is 1981 in Arabic (or conventional) numbers!

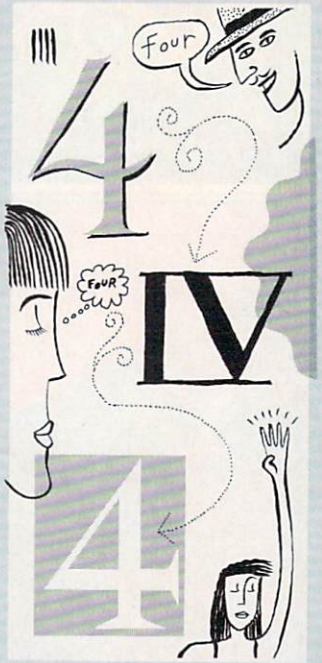
To use *Roman Numeral Converter*, just type the program into your computer, SAVE it, and then RUN it. You will be greeted by the main menu and given choices of converting Arabic to Roman, converting Roman to Arabic, or quitting. If you choose Arabic to Roman, you will be prompted to enter an Arabic number. Make sure not to put commas in your number (e.g., enter 2543 not 2,543).

The Arabic number you input must be no higher than 3999 due to limitations of computer character sets. The Roman numeral for 4000 is $M\overline{V}$ (a bar over a letter multiplies the value of that letter by 1000, so V = 5 but $\overline{V}$ = 5000). Some computers cannot print these overbars except in graphics mode, and other computers cannot print them at all. So our program only deals with Roman numbers that can be written using normal letters.

If your choice is Roman to Arabic, then you will be prompted to enter a Roman number, made up of these letters:

I = 1	C = 100
V = 5	D = 500
X = 10	M = 1000
L = 50	

Here are some examples of Roman numbers and their Arabic counterparts:



II = 2
VIII = 8
XVII = 17
LXX = 70
CXL = 140
DCCCLXVI = 866
MCMLXXXVII = 1987

ROMAN RULES

1. The general principle is that a smaller-valued letter after a larger-valued one adds to the cumulative value, and a smaller letter before a larger one subtracts from its value.

2. Double subtractions are not allowed. For example, XCM is illegal because it is ambiguous: Do you first compute the value of XC and subtract it from M, getting 910, or do you subtract the value of X from CM, getting 890?

3. The same letter can't appear more than three times in a row. For example, you say IV, not IIII, and CM, not DCCCC.

4. I can only precede V or X; X can only precede L or C; and C can only precede D or M. For example, 999 is written CMXCIX, not IM.

Adam & Apple II series/*Roman Numeral Converter*

```
10 DIM R$(4,9),V(4)
20 FOR X = 1 TO 4:FOR Y = 1 TO 9-6*(X = 4)
30 READ R$(X,Y):NEXT Y,X
40 HOME:PRINT "-ROMAN NUMERAL CONVERTER-"
50 PRINT:PRINT:PRINT "DO YOU WANT TO"
60 PRINT:PRINT "<1> CONVERT NUMBERS FROM"
70 PRINT TAB(5);"ARABIC TO ROMAN,"
80 PRINT "<2> CONVERT NUMBERS FROM"
90 PRINT TAB(5);"ROMAN TO ARABIC, OR"
100 PRINT "<3> QUIT AND RETURN TO BASIC?"
110 PRINT:PRINT ">";
120 GET K$:K = VAL(K$):IF K < 1 OR K > 3 THEN 120
130 PRINT K:ON K GOTO 150,360,140
140 HOME:END
150 HOME:PRINT "-CONVERT ARABIC TO ROMAN-"
160 PRINT:PRINT "PLEASE ENTER A WHOLE NUMBER"
170 PRINT "BETWEEN 1 AND 3999 (WITHOUT"
180 PRINT "COMMAS), OR ENTER <R> TO"
190 PRINT "RETURN TO THE MENU."
200 PRINT:INPUT "WHAT IS YOUR CHOICE? ";N$:PRINT
210 IF LEFT$(N$,1) = "R" OR LEFT$(N$,1) = CHR$(82) THE
N 40
220 VA = VAL(N$):IF VA <= 0 OR VA <> INT(VA) THEN 160
230 IF VA <= 3999 THEN 260
240 PRINT VA;" IS TOO HIGH."
250 PRINT "PLEASE TRY AGAIN.":GOTO 200
260 LN = LEN(N$):VF = 1
270 FOR X = 1 TO LN:DG$ = MID$(N$,X,1)
280 IF DG$ >= "0" AND DG$ <= "9" THEN 300
290 VF = 0:X = LN:GOTO 310
300 V(LN+1-X) = VAL(DG$)
310 NEXT X:IF NOT VF THEN 160
320 RX$ = "":FOR PS = LN TO 1 STEP -1
330 IF V(PS) <> 0 THEN RX$ = RX$+R$(PS,V(PS))
340 NEXT PS
350 PRINT:PRINT "THE ROMAN NUMBER IS ";RX$:GOTO 160
360 HOME:PRINT "-CONVERT ROMAN TO ARABIC-"
370 PRINT:PRINT "PLEASE ENTER THE ROMAN NUMBER,"
380 PRINT "OR ENTER <R> TO RETURN TO THE"
390 PRINT "MENU."
400 PRINT:INPUT "WHAT IS YOUR CHOICE? ";M$:PRINT
410 IF LEFT$(M$,1) = "R" OR LEFT$(M$,1) = CHR$(82) THE
N 40
420 IF M$ = "" THEN 370
430 N$ = "":FOR X = 1 TO LEN(M$):C$ = MID$(M$,X,1)
440 C = ASC(C$):N$ = N$+CHR$(C-32*(C > 96)*(C < 123))
450 NEXT X:LN = LEN(N$):Z = 1:RN = 0
460 FOR X = 4 TO 1 STEP -1
470 FOR Y = 9-6*(X = 4) TO 1 STEP -1
480 H$ = MID$(N$,Z,LEN(R$(X,Y)))
490 IF H$ <> R$(X,Y) THEN 520
500 RN = RN+(Y*10^(X-1)):Z = Z+LEN(R$(X,Y)):Y = 1
510 IF Z > LN THEN X = 1:Y = 1
520 NEXT Y:NEXT X
530 IF Z > LN THEN 560
540 PRINT "INVALID NUMBER. PLEASE TRY"
550 PRINT "AGAIN.":GOTO 370
560 PRINT:PRINT "THE ARABIC NUMBER IS ";RN:GOTO 370
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

Atari 400/800, 600/800XL, & 130XE/*Roman Numeral Converter*

```
10 DIM C$(40),DG$(40),H$(40),M$(40),N$(40),P$(40)
20 DIM R$(120),RX$(40),TAB$(7),V(4),X$(40)
30 R$=CHR$(32):R$(120)=R$:R$(2)=R$:TAB$=R$
40 OPEN #3,4,0,"K:"
50 FOR X=1 TO 120 STEP 4:READ X$:R$(X)=X$:NEXT X
60 R$(120)=CHR$(32)
```

ILLUSTRATIONS BY JOSH GOSFIELD

```
70 PRINT CHR$(125);TAB$(1,7);"-ROMAN NUMERAL CONVERTER
-"
80 PRINT :PRINT :PRINT "DO YOU WANT TO"
90 PRINT :PRINT "<1> CONVERT NUMBERS FROM ARABIC"
100 PRINT TAB$(1,4);"TO ROMAN,"
110 PRINT "<2> CONVERT NUMBERS FROM ROMAN"
120 PRINT TAB$(1,4);"TO ARABIC, OR"
130 PRINT "<3> QUIT AND RETURN TO BASIC?"
140 PRINT :PRINT ">";
150 GET #3,K:K=K-48:IF K<1 OR K>3 THEN 150
160 PRINT K:ON K GOTO 180,420,170
170 PRINT CHR$(125):END
180 PRINT CHR$(125);TAB$(1,7);"-CONVERT ARABIC TO ROMA
N-"
190 PRINT :PRINT "PLEASE ENTER A WHOLE NUMBER"
200 PRINT "BETWEEN 1 AND 3999 (WITHOUT"
210 PRINT "COMMAS), OR ENTER <R> TO RETURN"
220 PRINT "TO THE MENU."
230 PRINT :PRINT "WHAT IS YOUR CHOICE";:INPUT N$:PRINT
240 IF N$="" THEN 190
250 IF N$(1,1)="R" OR N$(1,1)=CHR$(82) THEN 70
260 TRAP 190:VA=VAL(N$):IF VA<=0 OR INT(VA)<>VA THEN 1
90
270 TRAP 40000:IF VA<4000 THEN 300
280 PRINT VA;" IS TOO HIGH. PLEASE TRY AGAIN."
290 GOTO 230
300 LN=LEN(N$):VF=1
310 FOR X=1 TO LN:DG$=N$(X,X)
320 IF DG$<"0" OR DG$>"9" THEN VF=0:X=LN:GOTO 340
330 V(LN+1-X)=VAL(DG$)
340 NEXT X:IF  NOT VF THEN 190
350 RX$="":FOR PS=LN TO 1 STEP -1
360 IF V(PS)<>0 THEN RX$(LEN(RX$)+1)=R$((PS-1)*36+V(PS
)*4-3,(PS-1)*36+V(PS)*4)
370 NEXT PS:X$=""
380 FOR X=1 TO LEN(RX$):IF RX$(X,X)=CHR$(32) THEN 400
390 X$(LEN(X$)+1)=RX$(X,X)
400 NEXT X
410 PRINT :PRINT "THE ROMAN NUMBER IS ";X$:GOTO 190
420 PRINT CHR$(125);TAB$(1,7);"-CONVERT ROMAN TO ARABI
C-"
430 PRINT :PRINT "PLEASE ENTER THE ROMAN NUMBER,"
440 PRINT "OR ENTER <R> TO RETURN TO THE MENU."
450 PRINT :PRINT "WHAT IS YOUR CHOICE";:INPUT N$:PRINT
460 IF N$="" THEN 430
470 IF N$(1,1)="R" OR N$(1,1)=CHR$(82) THEN 70
480 FOR X=1 TO LEN(N$):C=ASC(N$(X,X))
490 N$(X,X)=CHR$(C-32*(C>96)*(C<123))
500 NEXT X:LN=LEN(N$):Z=1:RN=0
510 FOR X=4 TO 1 STEP -1:FOR Y=9-6*(X=4) TO 1 STEP -1
520 P$=R$((X-1)*36+Y*4-3,(X-1)*36+Y*4)
530 X$="":FOR Q=1 TO LEN(P$)
540 IF P$(Q,Q)<>CHR$(32) THEN X$(Q,Q)=P$(Q,Q)
550 NEXT Q:P$=X$:H$=""
560 IF Z+LEN(P$)-1<=LEN(N$) THEN H$=N$(Z,Z+LEN(P$)-1)
570 IF H$<>P$ THEN 600
580 RN=INT(RN+(Y*10^(X-1))+0.5):Y=1:Z=Z+(LEN(P$))
590 IF Z>LN THEN X=1:Y=1
600 NEXT Y:NEXT X
610 IF Z>LN THEN 640
620 PRINT "INVALID NUMBER. PLEASE TRY"
630 PRINT "AGAIN.":GOTO 430
640 PRINT :PRINT "THE ARABIC NUMBER IS ";RN:GOTO 430
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

Commodore 64 & 128/*Roman Numeral Converter*

```
10 DIM R$(4,9),V(4)
20 POKE 53281,0:POKE 53280,5
30 FOR X=1 TO 4:FOR Y=1 TO 9+6*(X=4):READ R$(X,Y)
40 NEXT Y,X
50 PRINT CHR$(147);TAB(7);"-ROMAN NUMERAL CONVERTER-"
60 PRINT:PRINT:PRINT "DO YOU WANT TO"
70 PRINT:PRINT "<1> CONVERT NUMBERS FROM ARABIC"
80 PRINT TAB(5);"TO ROMAN,"
90 PRINT "<2> CONVERT NUMBERS FROM ROMAN"
100 PRINT TAB(5);"TO ARABIC, OR"
110 PRINT "<3> QUIT AND RETURN TO BASIC?"
120 PRINT:PRINT ">";
130 GET K$:K=VAL(K$):IF K<1 OR K>3 THEN 130
140 PRINT K:ON K GOTO 160,350,150
150 PRINT CHR$(147):END
160 PRINT CHR$(147);TAB(7);"-CONVERT ARABIC TO ROMAN-"
170 PRINT:PRINT "PLEASE ENTER A WHOLE NUMBER"
180 PRINT "BETWEEN 1 AND 3999 (WITHOUT"
190 PRINT "COMMAS), OR ENTER <R> TO RETURN"
200 PRINT "TO THE MENU.":N$=""
210 PRINT:INPUT "WHAT IS YOUR CHOICE";N$:PRINT
220 IF LEFT$(N$,1)="R" THEN 50
230 VA=VAL(N$):IF VA<=0 OR INT(VA)<>VA THEN 170
240 IF VA<4000 THEN 260
250 PRINT VA;"IS TOO HIGH. PLEASE TRY AGAIN.":GOTO 210
260 LN=LEN(N$):VF=-1
270 FOR X=1 TO LN:DG$=MID$(N$,X,1)
280 IF DG$<"0" OR DG$>"9" THEN VF=0:X=LN:GOTO 300
290 V(LN+1-X)=VAL(DG$)
300 NEXT X:IF NOT VF THEN 170
310 RX$="":FOR PS=LN TO 1 STEP -1
320 IF V(PS)<>0 THEN RX$=RX$+R$(PS,V(PS))
330 NEXT PS
340 PRINT:PRINT "THE ROMAN NUMBER IS ";RX$:GOTO 170
350 PRINT CHR$(147);TAB(7);"-CONVERT ROMAN TO ARABIC-"
360 PRINT:PRINT "PLEASE ENTER THE ROMAN NUMBER,"
370 PRINT "OR ENTER <R> TO RETURN TO THE MENU.":N$=""
380 PRINT:INPUT "WHAT IS YOUR CHOICE";N$:PRINT
390 IF LEFT$(N$,1)="R" THEN 50
400 IF N$="" THEN 360
410 LN=LEN(N$):Z=1:RN=0
420 FOR X=4 TO 1 STEP -1:FOR Y=9+6*(X=4) TO 1 STEP -1
430 H$=MID$(N$,Z,LEN(R$(X,Y)))
440 IF H$<>R$(X,Y) THEN 470
450 RN=RN+(Y*10↑(X-1)):Z=Z+LEN(R$(X,Y)):Y=1
460 IF Z>LN THEN X=1:Y=1
470 NEXT Y:NEXT X
480 IF Z>LN THEN 500
490 PRINT "INVALID NUMBER. PLEASE TRY AGAIN.":GOTO 360
500 PRINT:PRINT "THE ARABIC NUMBER IS";RN:GOTO 360
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

IBM PC & compatibles/*Roman Numeral Converter*

This program has been tested and found to work on the following computers and hardware configurations using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 KEY OFF
20 DIM R$(4,9),V(4)
30 FOR X=1 TO 4:FOR Y=1 TO 9+6*(X=4):READ R$(X,Y)
40 NEXT Y,X
50 CLS:PRINT TAB(7);"-ROMAN NUMERAL CONVERTER-"
60 PRINT:PRINT:PRINT "Do you want to"
70 PRINT:PRINT "<1> Convert numbers from Arabic"
80 PRINT TAB(5);"to Roman,"
90 PRINT "<2> Convert numbers from Roman"
100 PRINT TAB(5);"to Arabic, or"
110 PRINT "<3> Quit and return to BASIC?"
120 PRINT:PRINT ">";
130 K$=INKEY$:K=VAL(K$):IF K<1 OR K>3 THEN 130
140 PRINT K:ON K GOTO 160,350,150
150 CLS:END
160 CLS:PRINT TAB(7);"-CONVERT ARABIC TO ROMAN-"
170 PRINT:PRINT "Please enter a whole number"
180 PRINT "between 1 and 3999 (without"
190 PRINT "commas), or enter <R> to return"
```

```
200 PRINT "to the menu."
210 PRINT:INPUT "What is your choice";N$:PRINT
220 IF LEFT$(N$,1)="R" OR LEFT$(N$,1)="r" THEN 50
230 VA=VAL(N$):IF VA<=0 OR INT(VA)<>VA THEN 170
240 IF VA<4000 THEN 260
250 PRINT VA;"is too high. Please try again.":GOTO 210
260 LN=LEN(N$):VF=-1
270 FOR X=1 TO LN:DG$=MID$(N$,X,1)
280 IF DG$<"0" OR DG$>"9" THEN VF=0:X=LN:GOTO 300
290 V(LN+1-X)=VAL(DG$)
300 NEXT X:IF NOT VF THEN 170
310 RX$="":FOR PS=LN TO 1 STEP -1
320 IF V(PS)<>0 THEN RX$=RX$+R$(PS,V(PS))
330 NEXT PS
340 PRINT:PRINT "The Roman number is ";RX$:GOTO 170
350 CLS:PRINT TAB(7);"-CONVERT ROMAN TO ARABIC-"
360 PRINT:PRINT "Please enter the Roman number,"
370 PRINT "or enter <R> to return to the menu."
380 PRINT:INPUT "What is your choice";M$:PRINT
390 IF LEFT$(M$,1)="R" OR LEFT$(M$,1)="r" THEN 50
400 IF M$="" THEN 360
410 N$="":FOR X=1 TO LEN(M$):C$=MID$(M$,X,1)
420 C=ASC(C$):N$=N$+CHR$(C-32*(C>96)*(C<123))
430 NEXT X:LN=LEN(N$):Z=1:RN=0
440 FOR X=4 TO 1 STEP -1:FOR Y=9+6*(X=4) TO 1 STEP -1
450 H$=MID$(N$,Z,LEN(R$(X,Y)))
460 IF H$<>R$(X,Y) THEN 490
470 RN=RN+(Y*10^(X-1)):Z=Z+LEN(R$(X,Y)):Y=1
480 IF Z>LN THEN X=1:Y=1
490 NEXT Y:NEXT X
500 IF Z>LN THEN 520
510 PRINT "Invalid number. Please try again.":GOTO 360
520 PRINT:PRINT "The Arabic number is";RN:GOTO 360
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

Tandy Color Computer w/Extended BASIC/ *Roman Numeral Converter*

```
10 CLEAR 1000
20 DIM R$(4,9),V(4)
30 FOR X=1 TO 4:FOR Y=1 TO 9+6*(X=4):READ R$(X,Y)
40 NEXT Y,X
50 CLS:PRINT TAB(3);"-ROMAN NUMERAL CONVERTER-"
60 PRINT:PRINT "DO YOU WANT TO"
70 PRINT:PRINT "<1> CONVERT NUMBERS FROM ARABIC"
80 PRINT TAB(5);"TO ROMAN,"
90 PRINT "<2> CONVERT NUMBERS FROM ROMAN"
100 PRINT TAB(5);"TO ARABIC, OR"
110 PRINT "<3> QUIT AND RETURN TO BASIC?"
120 PRINT:PRINT ">";
130 K$=INKEY$:K=VAL(K$):IF K<1 OR K>3 THEN 130
140 PRINT K:ON K GOTO 160,360,150
150 CLS:END
160 CLS:PRINT TAB(3);"-CONVERT ARABIC TO ROMAN-"
170 PRINT:PRINT "PLEASE ENTER A WHOLE NUMBER"
180 PRINT "BETWEEN 1 AND 3999 (WITHOUT"
190 PRINT "COMMAS), OR ENTER <R> TO RETURN"
200 PRINT "TO THE MENU.":N$=""
210 PRINT:INPUT "WHAT IS YOUR CHOICE";N$:PRINT
220 IF LEFT$(N$,1)="R" OR LEFT$(N$,1)=CHR$(82) THEN 50
230 VA=VAL(N$):IF VA<=0 OR INT(VA)<>VA THEN 170
240 IF VA<4000 THEN 270
250 PRINT VA;"IS TOO HIGH."
260 PRINT " PLEASE TRY AGAIN.":GOTO 210
270 LN=LEN(N$):VF=-1
280 FOR X=1 TO LN:DG$=MID$(N$,X,1)
290 IF DG$<"0" OR DG$>"9" THEN VF=0:X=LN:GOTO 310
300 V(LN+1-X)=VAL(DG$)
310 NEXT X:IF NOT VF THEN 170
320 RX$="":FOR PS=LN TO 1 STEP -1
330 IF V(PS)<>0 THEN RX$=RX$+R$(PS,V(PS))
340 NEXT PS
350 PRINT "THE ROMAN NUMBER IS ";RX$:GOTO 170
360 CLS:PRINT TAB(3);"-CONVERT ROMAN TO ARABIC-"
370 PRINT:PRINT "PLEASE ENTER THE ROMAN NUMBER,"
380 PRINT "OR ENTER <R> TO RETURN TO THE"
390 PRINT "MENU.":M$=""
400 PRINT:INPUT "WHAT IS YOUR CHOICE";M$:PRINT
410 IF LEFT$(M$,1)="R" OR LEFT$(M$,1)=CHR$(82) THEN 50
420 IF M$="" THEN 370
430 N$="":FOR X=1 TO LEN(M$):C$=MID$(M$,X,1):C=ASC(C$)
440 N$=N$+CHR$(C-32*(C>96)*(C<123)):NEXT X
450 LN=LEN(N$):Z=1:RN=0
460 FOR X=4 TO 1 STEP -1:FOR Y=9+6*(X=4) TO 1 STEP -1
470 H$=MID$(N$,Z,LEN(R$(X,Y)))
480 IF H$<>R$(X,Y) THEN 510
490 RN=RN+(Y*10^(X-1)):Z=Z+LEN(R$(X,Y)):Y=1
500 IF Z>LN THEN X=1:Y=1
510 NEXT Y:NEXT X
520 IF Z>LN THEN 550
530 PRINT "INVALID NUMBER."
540 PRINT "PLEASE TRY AGAIN.":GOTO 370
550 PRINT "THE ARABIC NUMBER IS";RN:GOTO 370
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

TI 99/4A/*Roman Numeral Converter*

```
10 DIM R$(4,9),V(4)
20 FOR X=1 TO 4
30 FOR Y=1 TO 9+6*(X=4)
40 READ R$(X,Y)
50 NEXT Y
60 NEXT X
70 CALL CLEAR
80 PRINT TAB(2);"ROMAN NUMERAL CONVERTER"
90 PRINT
100 PRINT
110 PRINT "DO YOU WANT TO"
120 PRINT
130 PRINT "<1> CONVERT NUMBERS FROM"
140 PRINT TAB(5);"ARABIC TO ROMAN,"
150 PRINT "<2> CONVERT NUMBERS FROM"
160 PRINT TAB(5);"ROMAN TO ARABIC, OR"
170 PRINT "<3> QUIT AND RETURN"
180 PRINT TAB(5);"TO BASIC?"
190 PRINT
200 PRINT ">";
210 CALL KEY(3,K,S)
220 IF S=0 THEN 210
230 IF (K<49)+(K>51)THEN 210
240 K=K-48
250 PRINT K
260 IF K=1 THEN 300
270 IF K=2 THEN 660
280 CALL CLEAR
290 END
300 CALL CLEAR
310 PRINT "CONVERT ARABIC TO ROMAN"
320 PRINT
330 PRINT "PLEASE ENTER A WHOLE NUMBER"
340 PRINT "BETWEEN 1 AND 3999 (WITHOUT"
350 PRINT "COMMAS), OR ENTER <R> TO"
360 PRINT "RETURN TO THE MENU."
370 PRINT
380 INPUT "WHAT IS YOUR CHOICE? ":N$
390 PRINT
400 IF SEG$(N$,1,1)="R" THEN 70
410 VA=VAL(N$)
420 IF (VA<=0)+(VA<>INT(VA))THEN 320
430 IF VA<=3999 THEN 470
440 PRINT VA;" IS TOO HIGH."
450 PRINT " PLEASE TRY AGAIN."
```

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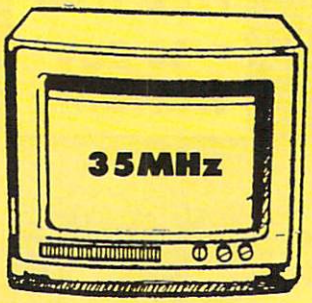

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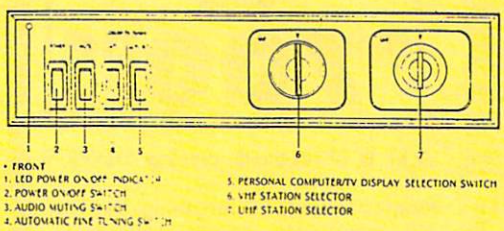

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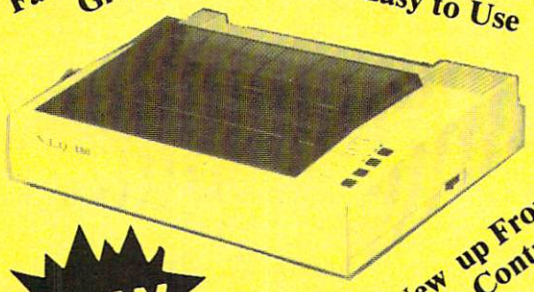

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Fanfold, Multipart paper: max. 3 sheets (original plus 2 copies)
Character Fonts
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Printing Method
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Printing Characters
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CIRCLE READER SERVICE 40

```
460 GOTO 370
470 LN=LEN(N$)
480 VF=1
490 FOR X=1 TO LN
500 DG$=SEG$(N$,X,1)
510 IF (DG$<"0")+(DG$>"9")THEN 540
520 V(LN+1-X)=VAL(DG$)
530 GOTO 560
540 VF=0
550 X=LN
560 NEXT X
570 IF VF=0 THEN 320
580 RX$=""
590 FOR PS=LN TO 1 STEP -1
600 IF V(PS)=0 THEN 620
610 RX$=RX$&R$(PS,V(PS))
620 NEXT PS
630 PRINT
640 PRINT "THE ROMAN NUMBER IS ";RX$
650 GOTO 320
660 CALL CLEAR
670 PRINT "CONVERT ROMAN TO ARABIC"
680 PRINT
690 PRINT "PLEASE ENTER THE ROMAN"
700 PRINT "NUMBER, OR ENTER <R> TO"
710 PRINT "RETURN TO THE MENU."
720 PRINT
730 PRINT "WHAT IS YOUR"
740 INPUT "CHOICE? ":N$
750 PRINT
760 IF SEG$(N$,1,1)="R" THEN 70
770 IF N$="" THEN 680
780 LN=LEN(N$)
790 Z=1
800 RN=0
810 FOR X=4 TO 1 STEP -1
820 FOR Y=9+6*(X=4)TO 1 STEP -1
830 H$=SEG$(N$,Z,LEN(R$(X,Y)))
840 IF H$<>R$(X,Y)THEN 910
850 RN=RN+(Y*10^(X-1))
860 Z=Z+LEN(R$(X,Y))
870 Y=1
880 IF Z<=LN THEN 910
890 X=1
900 Y=1
910 NEXT Y
920 NEXT X
930 IF Z>LN THEN 970
940 PRINT "INVALID NUMBER."
950 PRINT "PLEASE TRY AGAIN."
960 GOTO 680
970 PRINT
980 PRINT "THE ARABIC NUMBER IS ";RN
990 GOTO 680
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

VIC-20/*Roman Numeral Converter*

```
10 DIM R$(4,9),V(4)
20 FOR X=1 TO 4:FOR Y=1 TO 9+6*(X=4):READ R$(X,Y)
30 NEXT Y,X
40 PRINT CHR$(147);"ROMAN NUMBER CONVERTER"
50 PRINT:PRINT:PRINT "DO YOU WANT TO"
60 PRINT:PRINT "<1> CONVERT NUMBERS"
70 PRINT TAB(4);"FROM ARABIC"
80 PRINT TAB(4);"TO ROMAN,"
90 PRINT "<2> CONVERT NUMBERS"
100 PRINT TAB(4);"FROM ROMAN"
110 PRINT TAB(4);"TO ARABIC, OR"
120 PRINT "<3> QUIT AND RETURN"
130 PRINT TAB(4);"TO BASIC?"
140 PRINT:PRINT ">";
150 GET K$:K=VAL(K$):IF K<1 OR K>3 THEN 150
160 PRINT K:ON K GOTO 180,410,170
170 PRINT CHR$(147):END
180 PRINT CHR$(147);TAB(3);"ARABIC TO ROMAN"
190 PRINT:PRINT "PLEASE ENTER A WHOLE"
200 PRINT "NUMBER BETWEEN 1 AND"
210 PRINT "3999 (WITHOUT COMMAS)"
220 PRINT "OR ENTER <R> TO"
230 PRINT "RETURN TO THE MENU."
240 PRINT:PRINT "WHAT IS YOUR"
250 INPUT "CHOICE";N$:PRINT
260 IF LEFT$(N$,1)="R" THEN 40
270 VA=VAL(N$):IF VA<=0 OR INT(VA)<>VA THEN 190
280 IF VA<4000 THEN 310
290 PRINT VA;"IS TOO HIGH."
300 PRINT " PLEASE TRY AGAIN.":GOTO 240
310 LN=LEN(N$):VF=-1
320 FOR X=1 TO LN:DG$=MID$(N$,X,1)
330 IF DG$<"0" OR DG$>"9" THEN VF=0:X=LN:GOTO 350
340 V(LN+1-X)=VAL(DG$)
350 NEXT X:IF NOT VF THEN 190
360 RX$="":FOR PS=LN TO 1 STEP -1
370 IF V(PS)<>0 THEN RX$=RX$+R$(PS,V(PS))
380 NEXT PS
390 PRINT:PRINT "THE ROMAN NUMBER"
400 PRINT "IS ";RX$:GOTO 190
410 PRINT CHR$(147);TAB(3);"ROMAN TO ARABIC"
420 PRINT:PRINT "PLEASE ENTER THE"
430 PRINT "ROMAN NUMBER, OR"
440 PRINT "ENTER <R> TO RETURN"
450 PRINT "TO THE MENU."
460 PRINT:PRINT "WHAT IS YOUR"
470 INPUT "CHOICE";N$:PRINT
480 IF LEFT$(N$,1)="R" THEN 40
490 IF N$="" THEN 420
500 LN=LEN(N$):Z=1:RN=0
510 FOR X=4 TO 1 STEP -1:FOR Y=9+6*(X=4) TO 1 STEP -1
520 H$=MID$(N$,Z,LEN(R$(X,Y)))
530 IF H$<>R$(X,Y) THEN 560
540 RN=RN+(Y*10^(X-1)):Z=Z+LEN(R$(X,Y)):Y=1
550 IF Z>=LN THEN X=1:Y=1
560 NEXT Y:NEXT X
570 IF Z>LN THEN 600
580 PRINT "INVALID NUMBER."
590 PRINT "PLEASE TRY AGAIN.":GOTO 420
600 PRINT:PRINT "THE ARABIC NUMBER"
610 PRINT "IS";RN:GOTO 420
1000 DATA I,II,III,IV,V,VI,VII,VIII,IX
1010 DATA X,XX,XXX,XL,L,LX,LXX,LXXX,XC
1020 DATA C,CC,CCC,CD,D,DC,DCC,DCCC,CM
1030 DATA M,MM,MMM
```

MODIFICATIONS FOR OTHER COMPUTERS

Macintosh w/Microsoft BASIC 2.0 or 2.1/ *Roman Numeral Converter*

Use the IBM PC version omitting line 10.

Tandy Models III & 4 (Model III mode)/ *Roman Numeral Converter*

Use the IBM PC version except change lines 10, 170, 360, and 470 to read as follows:

```
10 CLEAR 1000
170 N$="":PRINT:PRINT "Please enter a whole number"
360 M$="":PRINT:PRINT "Please enter the Roman number,"
470 RN=RN+(Y*10[(X-1)):Z=Z+LEN(R$(X,Y)):Y=1
```

NOTE: *To type the bracket, use the "↑" (up arrow) key.*

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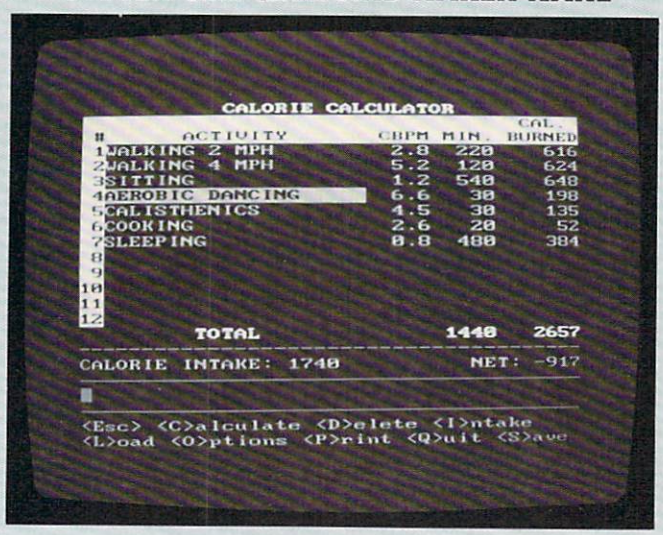
CALORIE CALCULATOR

BY STEVEN C.M. CHEN AND KAREN KANE



If you've ever counted calories or wondered how much bike riding you need to do to burn off the extra calories from last night's slice of double-chocolate layer cake, then our *Calorie Calculator* program may be just what you need. Bernadette Grey, associate editor at FAMILY COMPUTING, came up with the idea of a program that could track her daily calorie expenditure and compare it to her calorie intake, and was the first to try it out.

BERNADETTE'S DAY

Bernadette recorded all of her activities and everything she ate in a 24-hour period. Her day started with a 50-minute walk to work, where she read the paper and had a large bran muffin and a pint of orange juice. At work, Bernadette averaged six hours of desk work (sitting), and two hours of walking or standing. For lunch she ate plain yogurt, an unbuttered whole wheat bagel, a banana, and a diet soda. She also admitted to sampling two Girl Scout Cookies but rumor has it that she nibbled a few more than two.

After work, Bernadette walked home (50 minutes), had a slice of pizza and a diet soda, and then walked to and from the gym (10 minutes each way) for 60 minutes of stretching, aerobics, and calisthenics. Bernadette then read and watched some television for three hours and retired for eight hours of sleep. The hour and 20 minutes that were not accounted for with specific activities, were spent dressing, preparing or buying food, and eating.

Bernadette then put the activity information into *Calorie Calculator* and used the chart below to estimate the number of calories that were burned per minute for each activity. Bernadette used the statistics listed for a 130-pound person since that was the closest to her actual weight. She also estimated that she had consumed about 1,740 calories that day. With the program she was able to calculate the total number of calories burned and the NET result (total caloric intake minus total calories burned). Because Bernadette's NET total was a negative number (−917), she probably lost weight that day! She could either treat herself to a few extra calories (e.g., a double scoop of Häagen Dazs ice cream), or accumulate the negative calories for a very positive effect. For every 3,500 calories over her intake that she burns, she will lose one pound of body fat. Although Bernadette watches her diet, she is careful to maintain healthy eating habits and is sure to inform her doctor of any significant fluctuation in her weight.

HOW *CALORIE CALCULATOR* WORKS

When you run the program, a worksheet appears on the screen. The worksheet is a place where you can input activities, the number of calories burned per minute (CBPM), and the number of minutes you performed each activity (MIN). If you are familiar with spreadsheets, you will recognize the "cells" for data entry, the recalculation function, and the ability to set up a template.

HOW TO INPUT INFORMATION

To move around the worksheet, press the arrow keys. These keys move the highlighted cell from one column to another within a row, or from one row to another within a column. (Apple II Plus users must use CTRL-J to move down and CTRL-K to move up.)

To enter your first activity, position the highlighted cell in the activity column at row 1 (see photo). Type your activity (e.g., WALKING 2 MPH) at the entry line and press RETURN or ENTER (or an arrow key). Your activity will automatically appear in the highlighted cell. You can input up to 12 activities in this column with up to 20 characters per activity.

On Apple computers, there is no inverse mode for lowercase characters, so the highlight will cause lowercase letters to appear as special characters (e.g., @, %, !). They will turn back to normal when you move the highlighted cell and will print correctly.

Next, you can move (using the arrow keys) to the column marked CBPM. This column is for entering the calories burned per minute doing a specific activity. If you've been walking 2 miles per hour, you would check the chart for this activity and find the number which corresponds most closely to your weight (e.g., a 130-pound person will burn approximately 2.8 calories per minute.)

You may wish to adjust the numbers in the chart to more closely represent your weight. If, for example, you weigh somewhere between 130 and 150 pounds, you could select some number between 2.8 and 3.1 for the CBPM entry.

Once you select a number, make sure the highlighted cell is in the CBPM column next to the correct activity. Enter your number on the entry line and press RETURN or an arrow key to see the entry appear in the highlighted cell. This column will accept 1-, 2-, or 3-digit numbers up to 25.0.

You will next want to enter the number of minutes you perform each activity in the column marked MIN. Position the highlighted cell and enter your activity time in minutes from 1 to 900.

If you make a mistake in the input mode and have not yet pressed RETURN, you can erase your last entry with the <ESC>ape key. Pressing <ESC>ape again will take you to the beginning of the entry line. You can also delete one character at a time with the backspace delete key. Apple users can also use CTRL-B to delete one character at a time.

USING THE COMMAND MENU

Up to this point in our example, all of the worksheet data has been entered in the input mode from the entry line. To

view a list of other functions available in *Calorie Calculator*, type slash (/). This displays a menu of commands at the bottom of the screen. The command keys include <ESC>ape, <C>alculate, <D>elete, <I>ntake, <L>oad, <O>ptions, <Q>uit, and <S>ave.

<ESC>ape. Selecting the escape key from the command or options menu takes you back to the entry line. You can also press <ESC>ape to exit a function that you have selected from a menu. If, for example, you selected the <P>rint function from the command menu and then realized that you were not ready to print your calorie worksheet, you could press <ESC>ape to exit the command.

<C>alculate. You can choose the <C> key from the menu to calculate the number of calories burned for each activity and the total number of calories burned for all activities listed. This command will also calculate a net total, where NET TOTAL = TOTAL CALORIC INTAKE - TOTAL CALORIES BURNED. If you change a number entry, you must use this command to recalculate the CAL. BURNED column and the NET.

<D>elete. The <D> key deletes the current row. Choosing this command will not only delete the area under the highlighted cell but the entire row of that entry (i.e., ACTIVITY, CBPM, MIN., and CAL. BURNED). Entries below a deleted row will automatically move up to fill the vacant space.

<I>ntake. Selecting the <I> key lets you input the number of calories consumed. If you intend to compare the number of calories burned in a given day with the number of calories consumed, or if you just want to know how long you would have to swim to burn up the calories in a turkey sandwich, you must estimate how many calories are in the turkey sandwich.

To estimate your caloric intake, you will need a thorough calorie chart like *LeGette's Calorie Encyclopedia* (Warner Books, 1983). The intake entry must be a positive number less than 10,000. No decimal values will be

CALORIES BURNED PER MINUTE

Activity	Weight in Pounds 110	130	150	170	190
Aerobic Dancing	5.8	6.6	7.2	7.8	8.6
Basketball	6.9	8.1	9.4	10.6	11.9
Calisthenics	3.9	4.5	6.4	7.3	7.91
Climbing hills	6.0	7.1	8.2	9.3	10.4
Cooking	2.2	2.6	3.0	3.4	3.8
Cycling	5.0	5.9	6.8	7.7	8.6
Dancing	8.4	9.9	11.4	12.9	14.5
Sitting	1.0	1.2	1.4	1.6	1.8
Golf	4.2	5.0	5.7	6.5	7.3
Playing piano	2.0	2.3	2.7	3.0	3.4
Painting (outside)	3.8	4.5	5.2	5.9	6.6
Running (11 min mile)	6.7	7.9	9.2	10.4	11.6
Snow skiing	5.9	7.0	8.1	9.1	10.2
Standing	1.2	1.5	1.7	2.0	2.2
Squash	10.6	12.5	14.4	16.3	18.3
Swimming (fast crawl)	7.8	9.2	10.6	12.0	13.4
Tennis	5.5	6.4	7.4	8.4	9.4
Walking 2 mph	2.4	2.8	3.1	3.4	3.6
3 mph	3.9	4.5	4.9	5.4	5.8
4 mph	4.5	5.2	5.7	6.1	6.9

NOTE: *Portions of this chart were reproduced with permission from* Nutrition, Weight Control, and Exercise by Katch & McArdle, *(Lea & Febiger, 1983). Data from: "The Relative Energy Requirements of Physical Activity," E.W. Bannister and S.R. Brown,* Exercise Physiology, *Academic Press, New York, 1968; "The Caloric Costs of Running and Walking One Mile for Men and Women," E.T. Howley and M.E. Glover,* Medicine and Science in Sports *6:235, 1975; "Human Energy Expenditure," R. Passmore and J.V.G.A. Durnin,* Physiological Reviews *35:801, 1955.*

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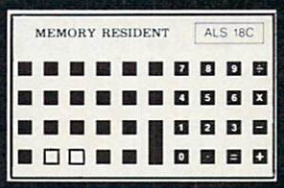

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accepted.

<**L**>**oad.** The <L> key will let you load a previously saved file. If you try to load a file that has not been saved you will get an error message. Simply press any key to continue. To load or save a file to or from your second disk drive, you must specify the drive at the FILENAME prompt. On IBM PC & compatibles, type "B:" and then the filename. For the Apple version, add ",D2" to the end of the filename. If you save or load to the second disk drive on the Apple it will change the default drive. You can only use one disk drive in the Commodore version.

<**O**>**ptions.** The <O> key displays the option menu where you can choose to enter your <N>ame, the <D>ate, or your <W>eight. Any of these options can include up to twenty characters. To return to the entry line, choose <ESC> from the option menu. If you enter a <N>ame, <D>ate, and/or <W>eight option, they will be recorded by the program and will appear on a printout, but not on the main worksheet screen.

<**P**>**rint.** This key allows those of you with an 80-column printer to <P>rint your chart. When you select the <P> key, you will be asked to "PRESS <SPACE BAR> WHEN PRINTER READY." Make sure that your printer is hooked up correctly and turned on. If you do not wish to print at this time, simply press <ESC>ape.

<**Q**>**uit.** <Q> lets you quit the program altogether. After selecting this key, you must "PRESS <Y> TO EXIT OR <ESC> TO CONTINUE."

<**S**>**ave.** The <S> key lets you save the chart with any filename you choose. Using an already existing filename to save a new file will overwrite the old file. Make sure you don't overwrite a file unless you want to because the program will not give any warning.

The program will not allow you to see a catalog of saved files. To do that, you must exit the *Calorie Calculator* and type the command for your computer (CATALOG for Apple, FILES for IBM PCs, and LOAD"$",8 for Commodore).

CREATING A TEMPLATE

Because Bernadette has set up and saved a worksheet of daily activities and the CBPM for each, she can use the program as a template. If she wants to calculate her calorie expenditure she can just load the program, select <L>oad from the command menu, and type the filename that the worksheet was saved under (e.g., CALORIE.BG).

Using this worksheet as a template, Bernadette can simply change the <D>ate, enter changes in the time each activity is performed, add activities that are not included, or delete any that do not apply. As her weight changes, she may even want to save several templates with different CBPM statistics.

TYPING TIPS

Calorie Calculator is a fairly long program so it's probably a good idea to type it in small sections, SAVEing your work frequently. Don't be discouraged if it doesn't run the first time you try it. The best way to find your typing errors is to print a listing of the program and proofread it carefully. Or better yet, have a friend or family member read the program lines to you character by character. Remember that the program must be typed in *exactly* as it appears in the magazine if it is to run correctly. Finally, when you've got the program running, make a backup copy.

Apple II series w/48K RAM & disk drive (printer optional)/*Calorie Calculator*

```
10 DIM A$(12),CM$(13),N$(12),S$(5),SN$(3),TT$(3)
20 DIM CV(2),DV(3,12),FL(4),KY(4),XP(4)
30 HOME:D$ = CHR$(4):E$ = CHR$(27):G$ = CHR$(7)
40 R$ = CHR$(13):SP$ = CHR$(32):BL$ = SP$:DA$ = "-"
50 L$ = "=":FOR L = 2 TO 39:BL$ = BL$+SP$
60 DA$ = DA$+"-":L$ = L$+"=":NEXT L
70 FOR L = 1 TO 4:READ T,XP(L):S$(L) = MID$(BL$,1,T)
80 NEXT L:S$(5) = MID$(BL$,1,14)
90 FOR L = 1 TO 3:READ TT$(L):NEXT L
100 FOR L = 1 TO 4:READ KY(L):NEXT L
110 FOR L = 1 TO 13:READ T:CM$(L) = CHR$(T):NEXT L
120 FOR L = 1 TO 4:READ FL(L):NEXT L:FOR L = 1 TO 12
130 N$(L) = "":IF L < 10 THEN N$(L) = SP$
140 N$(L) = N$(L)+STR$(L)
150 A$(L) = "":FOR M = 1 TO 3:DV(M,L) = 0
160 NEXT M,L:FOR L = 1 TO 3:SN$(L) = "":NEXT L
170 IT = 0:CX = 1:CY = 1:CV(1) = 25:CV(2) = 900
180 T = FRE(0):HOME:PRINT TAB(12);"CALORIE CALCULATOR"
190 INVERSE:PRINT TAB(35);"CAL. "
200 PRINT " #";TAB(9);"ACTIVITY";
210 PRINT TAB(24);"CBPM MIN. BURNED"
220 FOR L = 1 TO 12:PRINT N$(L):NEXT L:NORMAL
230 PRINT TAB(10);"TOTAL":PRINT DA$
240 PRINT "CALORIE INTAKE:":PRINT L$:PRINT:PRINT L$
250 DM = -1:GOSUB 2000
260 VTAB 22:HTAB 1:PRINT "PRESS </> FOR MENU."
270 VTAB 20:HTAB 1:GET K$:IF K$ > CHR$(31) THEN 360
280 CK = 0:FOR L = 1 TO 4
290 IF K$ = CHR$(KY(L)) THEN CK = L:L = 4
300 NEXT L:IF CK = 0 THEN 270
310 DM = 0:GOSUB 2000:ON CK GOTO 320,320,340,340
320 CX = CX-(CK = 1)+(CK = 2)
330 CX = CX+3*((CX = 0)-(CX = 4)):GOTO 250
340 CY = CY-(CK = 3)+(CK = 4)
350 CY = CY+12*((CY = 0)-(CY = 13)):GOTO 250
360 IF K$ = "/" THEN 440
370 GOSUB 4000:VTAB 22:HTAB 1:PRINT BL$:H$ = "INPUT:"
380 T$ = K$:GOSUB 5000:IF K$ = E$ THEN 260
390 IF CX = 1 THEN A$(CY) = T$:GOTO 430
400 T = VAL(T$)
410 IF T > CV(CX-1) OR T < 0 THEN PRINT G$;:GOTO 430
420 DV(CX-1,CY) = T
430 ON (K$ = R$) GOTO 250:GOTO 280
440 VTAB 22:HTAB 1
450 PRINT "<ESC> <C>ALCULATE <D>ELETE <I>NTAKE"
460 PRINT "<L>OAD <O>PTIONS <P>RINT <Q>UIT <S>AVE"
470 GOSUB 6000:SEL = 0:FOR L = 1 TO 9
480 IF K$ = CM$(L) THEN SEL = L:L = 9
490 NEXT L:IF SEL = 0 THEN PRINT G$;:GOTO 470
500 VTAB 22:HTAB 1:PRINT BL$:PRINT BL$
510 ON SEL GOTO 260,520,610,660,730,860,940,1190,730
520 FOR L = 1 TO 12:DV(3,L) = DV(1,L)*DV(2,L):NEXT L
530 TX = CX:TY = CY:DM = 0:CX = 4:FOR CY = 1 TO 12
540 GOSUB 2000:NEXT CY:CX = TX:CY = TY:MT = 0:CT = 0
550 FOR L = 1 TO 12:MT = MT+DV(2,L):CT = CT+DV(3,L)
560 NEXT L:VTAB 16:HTAB 27:Z = MT:PF = 4:GOSUB 3000
570 VTAB 16:HTAB 33:Z = CT:PF = 3:GOSUB 3000
580 T = IT-INT(CT+0.5):VTAB 18:HTAB 26:PRINT S$(5)
590 T$ = STR$(T):VTAB 18:HTAB 35-LEN(T$)
600 PRINT "NET: ";T$:GOTO 250
610 GOSUB 4000:IF CY = 12 THEN 640
620 FOR L = CY TO 11:A$(L) = A$(L+1)
630 FOR M = 1 TO 3:DV(M,L) = DV(M,L+1):NEXT M,L
640 A$(12) = "":FOR L = 1 TO 3:DV(L,12) = 0:NEXT L
650 GOSUB 8000:GOTO 250
660 GOSUB 4000:H$ = "INTAKE:"
670 T$ = "":IF IT <> 0 THEN T$ = STR$(IT)
680 GOSUB 5000:IF K$ = E$ THEN 250
690 T = INT(VAL(T$))
700 IF T < 0 OR T > 9999 THEN PRINT G$;:GOTO 250
710 VTAB 18:HTAB 17:PRINT S$(2)
720 IT = T:VTAB 18:HTAB 17:PRINT IT:GOTO 250
730 H$ = "FILENAME:":T$ = "":GOSUB 5000
```

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CIRCLE READER SERVICE 43

```
740 ON (T$ = "") GOTO 250:F$ = T$
750 T = FRE(0):VTAB 22:HTAB 1:ONERR GOTO 1290
760 IF SEL = 9 THEN 1240
770 PRINT D$;"UNLOCK ";F$
780 PRINT D$;"OPEN ";F$:PRINT D$;"READ ";F$
790 FOR L = 1 TO 12:INPUT A$(L)
800 FOR M = 1 TO 3:INPUT DV(M,L):NEXT M,L
810 FOR L = 1 TO 3:INPUT SN$(L):NEXT L:INPUT IT
820 PRINT D$;"CLOSE ";F$:POKE 216,0
830 CX = 1:CY = 1:GOSUB 8000:VTAB 18:HTAB 17
840 IF IT = 0 THEN PRINT S$(2):GOTO 520
850 PRINT IT:GOTO 520
860 VTAB 22:PRINT "<ESC> <D>ATE <N>AME <W>EIGHT"
870 GOSUB 6000:SS = -1:FOR L = 10 TO 13
880 IF K$ = CM$(L) THEN SS = L-10:L = 13
890 NEXT L:IF SS = -1 THEN PRINT G$;:GOTO 870
900 VTAB 22:HTAB 1:PRINT BL$:IF SS = 0 THEN 250
910 H$ = TT$(SS)+":":T$ = SN$(SS)
920 GOSUB 5000:IF K$ = E$ THEN 860
930 SN$(SS) = T$:GOTO 860
940 PRINT G$;:VTAB 20:HTAB 1
950 PRINT "PRESS <SPACE BAR> WHEN PRINTER READY.";
960 GET K$:IF K$ <> E$ AND K$ <> SP$ THEN 960
970 VTAB 20:HTAB 1:PRINT BL$:IF K$ = E$ THEN 250
980 PRINT:PRINT D$;"PR# 1"
990 PRINT TAB(32);"CALORIE CALCULATOR"
1000 PRINT:FOR L = 1 TO 3
1010 IF SN$(L) <> "" THEN PRINT TT$(L);": ";SN$(L)
1020 NEXT L:PRINT:PRINT DA$;DA$
1030 PRINT TAB(66);"CALORIES"
1040 PRINT TAB(7);"#";SPC(11);"ACTIVITY";SPC(19)"CBPM"
;
1050 PRINT SPC(5);"MINUTES";SPC(6);"BURNED"
1060 PRINT DA$;DA$:FOR L = 1 TO 12
1070 PRINT TAB(6);N$(L);SP$;SP$;A$(L);SPC(28-LEN(A$(L)
));:FOR M = 1 TO 3
1080 IF DV(M,L) = 0 THEN PRINT SPC(12);:GOTO 1110
1090 Z = DV(M,L):PRINT SPC(12-FL(M));
1100 PF = M:GOSUB 3000
1110 NEXT M:PRINT:NEXT L:PRINT DA$;DA$
1120 PRINT TAB(20);"TOTAL";SPC(31);
1130 PF = 4:Z = MT:GOSUB 3000:PRINT SPC(5);
1140 PF = 3:Z = CT:GOSUB 3000:PRINT:PRINT DA$;DA$
1150 PRINT "CALORIE INTAKE: ";IT;
1160 T$ = STR$(IT-INT(CT+0.5))
1170 PRINT SPC(52-LEN(STR$(IT))-LEN(T$));"NET: ";T$
1180 PRINT DA$;DA$:PRINT:PRINT D$;"PR# 0":GOTO 250
1190 PRINT G$;:VTAB 20:HTAB 1
1200 PRINT "PRESS <Y> TO EXIT OR <ESC> TO CONTINUE.";
1210 GOSUB 7000:IF K$ <> "Y" AND K$ <> E$ THEN 1210
1220 VTAB 20:HTAB 1:PRINT BL$:IF K$ <> "Y" THEN 250
1230 HOME:END
1240 PRINT D$;"OPEN ";F$:PRINT D$;"WRITE ";F$
1250 FOR L = 1 TO 12:PRINT A$(L):FOR M = 1 TO 3
1260 PRINT DV(M,L):NEXT M,L
1270 FOR L = 1 TO 3:PRINT SN$(L):NEXT L
1280 PRINT IT:PRINT D$;"CLOSE ";F$:POKE 216,0:GOTO 250
1290 PRINT D$;"CLOSE ";F$:PRINT G$;:VTAB 20:HTAB 1
1300 PRINT "CHECK DISKS/DRIVE; THEN PRESS ANY KEY.";
1310 GET K$:POKE 216,0
1320 VTAB 20:HTAB 1:PRINT BL$:GOTO 250
2000 VTAB 3+CY:HTAB XP(CX):IF DM THEN INVERSE
2010 IF CX > 1 THEN 2050
2020 T$ = A$(CY)
2030 IF T$ = "" THEN PRINT S$(CX):GOTO 2080
2040 PRINT T$;MID$(BL$,1,20-LEN(T$)):GOTO 2080
2050 T = DV(CX-1,CY)
2060 IF T = 0 THEN PRINT S$(CX):GOTO 2080
2070 Z = T:PF = CX-1:GOSUB 3000
2080 IF DM THEN NORMAL
2090 RETURN
3000 IF PF <> 1 THEN 3040
3010 T$ = STR$(INT((Z+0.0001)*10)/10+0.01)
3020 T$ = LEFT$(T$,LEN(T$)-1)
3030 PRINT LEFT$(BL$,5-LEN(T$));T$;:RETURN
3040 IF Z < 1 THEN T$ = "":GOTO 3060
3050 T$ = STR$(INT(Z+0.5))
3060 PRINT LEFT$(BL$,FL(PF)-LEN(T$));T$;:RETURN
4000 CT = 0:MT = 0:VTAB 16:HTAB 20:PRINT S$(1)
4010 VTAB 18:HTAB 26:PRINT S$(5):RETURN
5000 HL = LEN(H$)+2:LT = LEN(T$)
5010 VTAB 20:HTAB 1:PRINT H$;SP$;T$;SP$
5020 VTAB 20:HTAB HL+LT:GET K$
5030 IF K$ <> CHR$(2) AND K$ <> CHR$(127) THEN 5070
5040 IF LT = 0 THEN PRINT G$;:GOTO 5020
5050 IF LT = 1 THEN T$ = "":LT = 0:GOTO 5010
5060 T$ = LEFT$(T$,LT-1):LT = LT-1:GOTO 5010
5070 IF K$ > CHR$(31) THEN 5150
5080 IF K$ <> E$ THEN 5110
5090 IF T$ = "" THEN 5170
5100 VTAB 20:HTAB 1:PRINT BL$:T$ = "":LT = 0:GOTO 5010
5110 IF K$ = R$ THEN 5170
5120 T = 0:FOR L = 1 TO 4
5130 IF K$ = CHR$(KY(L)) THEN T = L:L = 4
5140 NEXT L:ON (T = 0) GOTO 5020:GOTO 5170
5150 IF LT = 20 THEN PRINT G$;:GOTO 5020
5160 LT = LT+1:T$ = T$+K$:PRINT K$;:GOTO 5020
5170 VTAB 20:HTAB 1:PRINT BL$:RETURN
6000 VTAB 20:HTAB 1:GOSUB 7000:RETURN
7000 GET K$:K = ASC(K$)
7010 K$ = CHR$(K-32*(K > 96)*(K < 123)):RETURN
8000 TX = CX:TY = CY:DM = 0
8010 FOR CY = TY TO 12:FOR CX = 1 TO 4:GOSUB 2000
8020 NEXT CX,CY:CX = TX:CY = TY:RETURN
9000 DATA 20,3,5,23,5,28,7,33
9010 DATA DATE,NAME,WEIGHT
9020 DATA 8,21,11,10
9030 DATA 27,67,68,73,76,79,80,81,83,27,68,78,87
9040 DATA 5,5,7,6
```

Commodore 64 & 128 (C 64 mode) w/disk drive (printer optional)/*Calorie Calculator*

```
10 DIM A$(12),CM$(13),N$(12),S$(5),SN$(3),TT$(3)
20 DIM CV(2),DV(3,12),FL(4),KY(4),XP(4)
30 POKE 649,10:POKE 650,0:POKE 53280,12:POKE 53281,12
40 S=54272:FOR L=0 TO 24:POKE S+L,0:NEXT L
50 POKE S+5,9:POKE S+6,0:POKE S+1,100:POKE S+24,15
60 E$=CHR$(95):EK$="<"+E$+">":OF$=CHR$(146)
70 Q$=CHR$(34):R$=CHR$(13):RV$=CHR$(18):SP$=CHR$(32)
80 WH$=CHR$(5):YL$=CHR$(158):BK$=RV$+SP$+OF$+CHR$(157)
90 BL$=SP$:DA$="-":L$=CHR$(195):FOR L=2 TO 39
100 BL$=BL$+SP$:DA$=DA$+"-":L$=L$+CHR$(195):NEXT L
110 PRINT CHR$(147);:FOR L=1 TO 4:READ T,XP(L)
120 S$(L)=MID$(BL$,1,T):NEXT L:S$(5)=MID$(BL$,1,14)
130 FOR L=1 TO 3:READ TT$(L):NEXT L
140 FOR L=1 TO 4:READ KY(L):NEXT L
150 FOR L=1 TO 13:READ T:CM$(L)=CHR$(T):NEXT L
160 FOR L=1 TO 4:READ FL(L):NEXT L
170 FOR L=1 TO 12:N$(L)="":IF L<10 THEN N$(L)=SP$
180 N$(L)=N$(L)+MID$(STR$(L),2):A$(L)="":FOR M=1 TO 3
190 DV(M,L)=0:NEXT M,L:FOR L=1 TO 3:SN$(L)="":NEXT L
200 IT=0:CX=1:CY=1:CV(1)=25:CV(2)=900
210 PRINT CHR$(147);TAB(11);WH$;"CALORIE CALCULATOR"
220 PRINT CHR$(31);RV$;BL$:PRINT RV$;BL$
230 POKE 214,0:PRINT:PRINT RV$;TAB(34);"CAL.";SP$
240 PRINT RV$;" #";SPC(7);"ACTIVITY";
250 PRINT SPC(6);"CBPM MIN. BURNED"
260 FOR L=1 TO 12:PRINT RV$;N$(L):NEXT L
270 PRINT TAB(9);YL$;"TOTAL":PRINT WH$;DA$
280 PRINT "CALORIE INTAKE:":PRINT L$:PRINT:PRINT L$
290 DM=-1:GOSUB 2000
300 POKE 214,20:PRINT:PRINT "PRESS </> FOR MENU."
310 GOSUB 4000
320 CK=0:FOR L=1 TO 4
330 IF K$=CHR$(KY(L)) THEN CK=L:L=4
340 NEXT L:IF CK=0 THEN 400
350 DM=0:GOSUB 2000:ON CK GOTO 360,360,380,380
360 CX=CX+(CK=1)-(CK=2)
370 CX=CX+3*((CX=4)-(CX=0)):GOTO 290
```

```
380 CY=CY+(CK=3)-(CK=4)
390 CY=CY+12*((CY=13)-(CY=0)):GOTO 290
400 IF K$<SP$ OR K$>CHR$(93) THEN GOSUB 5000:GOTO 310
410 IF K$="/" THEN 490
420 GOSUB 6000:POKE 214,20:PRINT:PRINT BL$
430 H$="INPUT:":T$=K$:GOSUB 7000:IF K$=E$ THEN 300
440 IF CX=1 THEN A$(CY)=T$:GOTO 480
450 T=VAL(T$)
460 IF T>CV(CX-1) OR T<0 THEN GOSUB 5000:GOTO 480
470 DV(CX-1,CY)=T
480 ON -(K$=R$) GOTO 290:GOTO 320
490 POKE 214,20:PRINT
500 PRINT EK$;" <C>ALCULATE <D>ELETE <I>NTAKE"
510 PRINT "<L>OAD <O>PTIONS <P>RINT <Q>UIT <S>AVE"
520 GOSUB 4000:SEL=0:FOR L=1 TO 9
530 IF K$=CM$(L) THEN SEL=L:L=9
540 NEXT L:IF SEL=0 THEN GOSUB 5000:GOTO 520
550 POKE 214,20:PRINT:PRINT BL$:PRINT BL$
560 ON SEL GOTO 300,570,680,730,810,930,1020,1260,810
570 FOR L=1 TO 12:DV(3,L)=DV(1,L)*DV(2,L):NEXT L
580 TX=CX:TY=CY:DM=0:CX=4:FOR CY=1 TO 12
590 GOSUB 2000:NEXT CY:CX=TX:CY=TY:MT=0:CT=0
600 FOR L=1 TO 12:MT=MT+DV(2,L):CT=CT+DV(3,L)
610 NEXT L:POKE 214,14:PRINT:PRINT TAB(26);YL$;
620 PM=0:Z=MT:PF=4:GOSUB 3000
630 PM=0:Z=CT:PF=3:GOSUB 3000
640 T=IT-INT(CT+0.5):NF$="":IF T<0 THEN NF$=SP$
650 POKE 214,16:PRINT:PRINT TAB(25);WH$;S$(5)
660 T$=STR$(T):POKE 214,16:PRINT
670 PRINT TAB(35-LEN(NF$+T$));"NET:";NF$;T$:GOTO 290
680 GOSUB 6000:IF CY=12 THEN 710
690 FOR L=CY TO 11:A$(L)=A$(L+1)
700 FOR M=1 TO 3:DV(M,L)=DV(M,L+1):NEXT M,L
710 A$(12)="":FOR L=1 TO 3:DV(L,12)=0:NEXT L
720 GOSUB 10000:GOTO 290
730 GOSUB 6000:H$="INTAKE:"
740 T$="":IF IT<>0 THEN T$=MID$(STR$(IT),2)
750 GOSUB 7000:IF K$=E$ THEN 290
760 POKE 214,16:PRINT
770 IF T$="" THEN IT=0:PRINT TAB(15);S$(2):GOTO 290
780 T=INT(VAL(T$))
790 IF T<0 OR T>9999 THEN GOSUB 5000:GOTO 290
800 IT=T:PRINT TAB(15);IT:GOTO 290
810 H$="FILENAME:":T$=""
820 GOSUB 7000:IF T$="" THEN 290
830 F$="0:"+T$+",S":CLOSE 2:OPEN 2,8,2,F$+",R":CLOSE 2
840 CLOSE 15:OPEN 15,8,15:INPUT#15,ER,ER$:CLOSE 15
850 IF SEL=9 THEN 1310
860 IF ER<>0 THEN 1380
870 OPEN 2,8,2,F$+",R":FOR L=1 TO 12:INPUT#2,A$(L)
880 FOR M=1 TO 3:INPUT#2,DV(M,L):NEXT M,L
890 FOR L=1 TO 3:INPUT#2,SN$(L):NEXT L:INPUT#2,IT
900 CLOSE 2:CX=1:CY=1:GOSUB 10000:POKE 214,16:PRINT
910 IF IT=0 THEN PRINT TAB(15);S$(2):GOTO 570
920 PRINT TAB(15);IT:GOTO 570
930 POKE 214,20:PRINT
940 PRINT EK$;" <D>ATE <N>AME <W>EIGHT"
950 GOSUB 9000:SS=-1:FOR L=10 TO 13
960 IF K$=CM$(L) THEN SS=L-10:L=13
970 NEXT L:IF SS=-1 THEN 950
980 POKE 214,20:PRINT:PRINT BL$:IF SS=0 THEN 290
990 H$=TT$(SS)+":":T$=SN$(SS)
1000 GOSUB 7000:IF K$=E$ THEN 930
1010 SN$(SS)=T$:GOTO 930
1020 GOSUB 5000:POKE 214,18:PRINT
1030 PRINT "PRESS <SPACE BAR> WHEN PRINTER READY.";
1040 GOSUB 8000:IF K$<>E$ AND K$<>SP$ THEN 1040
1050 POKE 214,18:PRINT:PRINT BL$:IF K$=E$ THEN 290
1060 OPEN 4,4:PRINT#4,TAB(31);"CALORIE CALCULATOR"
1070 PRINT#4:FOR L=1 TO 3
1080 IF SN$(L)<>"" THEN PRINT#4,TT$(L);": ";SN$(L)
1090 NEXT L:PRINT#4:PRINT#4,DA$;DA$
1100 PRINT#4,TAB(65);"CALORIES"
1110 PRINT#4,TAB(6);"#";SPC(11);"ACTIVITY";SPC(19)"CBP
M";
1120 PRINT#4,SPC(5);"MINUTES";SPC(6);"BURNED"
1130 PRINT#4,DA$;DA$:PM=-1:FOR L=1 TO 12
1140 PRINT#4,TAB(5);N$(L);SP$;SP$;A$(L);SPC(28-LEN(A$(
L)));:FOR M=1 TO 3
1150 IF DV(M,L)=0 THEN PRINT#4,SPC(12);:GOTO 1180
1160 Z=DV(M,L):PRINT#4,SPC(12-FL(M));
1170 PF=M:GOSUB 3000:PRINT#4,T$;
1180 NEXT M:PRINT#4:NEXT L:PRINT#4,DA$;DA$
1190 PRINT#4,TAB(19);"TOTAL";SPC(31);
1200 PF=4:Z=MT:GOSUB 3000:PRINT#4,T$;SPC(5);
1210 PF=3:Z=CT:GOSUB 3000:PRINT#4,T$:PRINT#4,DA$;DA$
1220 PRINT#4,"CALORIE INTAKE:";IT;:T=IT-INT(CT+0.5)
1230 T$=STR$(T):NF$="":IF T<0 THEN NF$=SP$
1240 PRINT#4,SPC(53-LEN(STR$(IT)+NF$+T$));"NET:";NF$;T
$
1250 PRINT#4,DA$;DA$:PRINT#4:PRINT#4:CLOSE 4:GOTO 290
1260 GOSUB 5000:POKE 214,18:PRINT
1270 PRINT "PRESS <Y> TO EXIT OR ";EK$;" TO CONTINUE."
;
1280 GOSUB 8000:IF K$<>"Y" AND K$<>E$ THEN 1280
1290 POKE 214,18:PRINT:PRINT BL$:IF K$<>"Y" THEN 290
1300 PRINT CHR$(147);:END
1310 IF ER<>0 AND ER<>62 THEN 1380
1320 IF ER=0 THEN F$="@"+F$
1330 OPEN 2,8,2,F$+",W"
1340 FOR L=1 TO 12:PRINT#2,Q$;A$(L);Q$
1350 FOR M=1 TO 3:PRINT#2,DV(M,L):NEXT M,L
1360 FOR L=1 TO 3:PRINT#2,Q$;SN$(L);Q$:NEXT L
1370 PRINT#2,IT:CLOSE 2:GOTO 290
1380 GOSUB 5000:POKE 214,18:PRINT
1390 PRINT "CHECK DISKS/DRIVE; THEN PRESS ANY KEY.";
1400 GOSUB 8000:POKE 214,18:PRINT:PRINT BL$:GOTO 290
2000 POKE 214,1+CY:PRINT:PRINT TAB(XP(CX));
2010 IF DM THEN PRINT RV$;
2020 IF CX>1 THEN 2050
2030 T$=A$(CY):IF T$="" THEN PRINT S$(CX):GOTO 2070
2040 PRINT T$;MID$(BL$,1,20-LEN(T$)):GOTO 2070
2050 T=DV(CX-1,CY):IF T=0 THEN PRINT S$(CX):GOTO 2070
2060 PM=0:Z=T:PF=CX-1:GOSUB 3000
2070 RETURN
3000 IF PF<>1 THEN 3050
3010 T$=MID$(STR$(INT((Z+0.0001)*10)/10+0.01),2)
3020 T$=LEFT$(T$,LEN(T$)-1)
3030 T$=LEFT$(BL$,5-LEN(T$))+T$:IF PM=0 THEN PRINT T$;
3040 RETURN
3050 T$=MID$(STR$(INT(Z+0.5)),2)
3060 T$=LEFT$(BL$,FL(PF)-LEN(T$))+T$
3070 IF PM=0 THEN PRINT T$;
3080 RETURN
4000 POKE 214,18:PRINT:PRINT BK$;
4010 PRINT SP$;CHR$(157);:GET K$:IF K$="" THEN 4000
4020 RETURN
5000 POKE S+4,17:FOR D=1 TO 40:NEXT D
5010 POKE S+4,16:RETURN
6000 CT=0:MT=0:POKE 214,14:PRINT:PRINT TAB(19);S$(1)
6010 POKE 214,16:PRINT:PRINT TAB(25);S$(5):RETURN
7000 HL=LEN(H$)+1:LT=LEN(T$)
7010 POKE 214,18:PRINT:PRINT H$;SP$;T$;SP$
7020 POKE 214,18:PRINT
7030 PRINT TAB(HL+LT);BK$;SP$;CHR$(157);
7040 GET K$:IF K$="" THEN 7020
7050 IF K$<>CHR$(20) THEN 7090
7060 IF LT=0 THEN 7020
7070 IF LT=1 THEN T$="":LT=0:GOTO 7010
7080 T$=LEFT$(T$,LT-1):LT=LT-1:GOTO 7010
7090 IF K$>CHR$(31) THEN 7140
7100 IF K$=R$ THEN 7180
7110 T=0:FOR L=1 TO 4
7120 IF K$=CHR$(KY(L)) THEN T=L:L=4
7130 NEXT L:ON -(T=0) GOTO 7020:GOTO 7180
7140 IF K$=E$ AND T$="" THEN 7180
7150 IF K$=E$ THEN POKE 214,18:PRINT:PRINT BL$:PRINT:T
$="":LT=0:GOTO 7010
7160 IF LT=20 THEN GOSUB 5000:GOTO 7020
7170 LT=LT+1:T$=T$+K$:PRINT K$;:GOTO 7020
```

```
7180 POKE 214,18:PRINT:PRINT BL$:RETURN
8000 GET K$:ON -(K$="") GOTO 8000:RETURN
9000 GOSUB 4000:K=ASC(K$)
9010 K$=CHR$(K-32*(K>96)*(K<123)):RETURN
10000 TX=CX:TY=CY:DM=0
10010 FOR CY=TY TO 12:FOR CX=1 TO 4:GOSUB 2000
10020 NEXT CX,CY:CX=TX:CY=TY:RETURN
11000 DATA 20,2,5,22,5,27,7,32
11010 DATA DATE,NAME,WEIGHT
11020 DATA 157,29,145,17
11030 DATA 95,67,68,73,76,79,80,81,83,95,68,78,87
11040 DATA 5,5,7,6
```

IBM PC & compatibles w/128K RAM & disk drive (printer optional)/*Calorie Calculator*

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer Card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 DEF SEG=&H40:V=PEEK(&H10) AND 48:DEF SEG
20 KEY OFF:IF V=32 THEN WIDTH 40:VL=7 ELSE VL=14
30 DIM A$(12),N$(12),PF$(4),S$(5),SN$(3),TT$(3)
40 DIM CV(2),DV(3,12),XP(4)
50 WIDTH "LPT1:",80:LOCATE ,,0,0,VL:COLOR 2,0:CLS
60 BL$=STRING$(39,32):DA$=STRING$(39,45):R$=CHR$(13)
70 L$=STRING$(39,196):E$=CHR$(27):SP$=CHR$(32)
80 FOR L=1 TO 4:READ T,XP(L),PF$(L)
90 S$(L)=STRING$(T,32):NEXT L:S$(5)=STRING$(14,32)
100 FOR L=1 TO 3:READ TT$(L):NEXT L
110 FOR L=1 TO 12:IF L<10 THEN N$(L)=SP$ ELSE N$(L)=""
120 N$(L)=N$(L)+MID$(STR$(L),2):A$(L)="":FOR M=1 TO 3
130 DV(M,L)=0:NEXT M,L:FOR L=1 TO 3:SN$(L)="":NEXT L
140 IT=0:CX=1:CY=1:CV(1)=25:CV(2)=900
150 COLOR 14:CLS:PRINT TAB(12);"CALORIE CALCULATOR"
160 COLOR 0,3:PRINT TAB(35);"CAL. "
170 PRINT " #";TAB(9);"ACTIVITY";
180 PRINT TAB(24);"CBPM MIN. BURNED"
190 FOR L=1 TO 12:PRINT N$(L):NEXT L:COLOR 10,0
200 PRINT TAB(10);"TOTAL":COLOR 2:PRINT DA$
210 PRINT "CALORIE INTAKE:":PRINT L$:PRINT:PRINT L$
220 DM=-1:GOSUB 2000
230 LOCATE 22,1:PRINT "PRESS </> FOR MENU."
240 LOCATE 20,1:GOSUB 3000:IF LEN(K$)=1 THEN 310
250 CK=INSTR("KMHP",RIGHT$(K$,1)):IF CK=0 THEN 240
260 DM=0:GOSUB 2000:ON CK GOTO 270,270,290,290
270 CX=CX+(CK=1)-(CK=2)
280 CX=CX+3*((CX=4)-(CX=0)):GOTO 220
290 CY=CY+(CK=3)-(CK=4)
300 CY=CY+12*((CY=13)-(CY=0)):GOTO 220
310 IF K$<SP$ THEN 240
320 IF K$="/" THEN 400
330 GOSUB 4000:LOCATE 22,1:PRINT BL$
340 H$="INPUT:":T$=K$:GOSUB 5000:IF K$=E$ THEN 230
350 IF CX=1 THEN A$(CY)=T$:GOTO 390
360 T=VAL(T$)
370 IF T>CV(CX-1) OR T<0 THEN SOUND 200,1:GOTO 390
380 DV(CX-1,CY)=T
390 IF K$=R$ THEN 220 ELSE 250
400 LOCATE 22,1
410 PRINT "<Esc> <C>alculate <D>elete <I>ntake"
420 PRINT "<L>oad <O>ptions <P>rint <Q>uit <S>ave"
430 GOSUB 6000:SEL=INSTR(E$+"CDILOPQS",K$)
440 IF SEL=0 THEN SOUND 200,1:GOTO 430
450 LOCATE 22,1:PRINT BL$:PRINT BL$
460 ON SEL GOTO 230,470,560,610,680,790,860,1090,680
470 FOR L=1 TO 12:DV(3,L)=DV(1,L)*DV(2,L):NEXT L
480 TX=CX:TY=CY:DM=0:CX=4:FOR CY=1 TO 12
490 GOSUB 2000:NEXT CY:CX=TX:CY=TY:MT=0:CT=0
500 FOR L=1 TO 12:MT=MT+DV(2,L):CT=CT+DV(3,L):NEXT L
510 COLOR 10:LOCATE 16,28:PRINT USING PF$(3);MT
520 LOCATE 16,34:PRINT USING "######";CT:COLOR 2
530 T=INT(IT-CT):LOCATE 18,26:PRINT S$(5)
540 T$=STR$(T):IF T<0 THEN T$=SP$+T$
550 LOCATE 18,36-LEN(T$):PRINT "NET:";T$:GOTO 220
560 GOSUB 4000:IF CY=12 THEN 590
570 FOR L=CY TO 11:A$(L)=A$(L+1)
580 FOR M=1 TO 3:DV(M,L)=DV(M,L+1):NEXT M,L
590 A$(12)="":FOR L=1 TO 3:DV(L,12)=0:NEXT L
600 GOSUB 8000:GOTO 220
610 GOSUB 4000:H$="Intake:"
620 IF IT=0 THEN T$="" ELSE T$=MID$(STR$(IT),2)
630 GOSUB 5000:IF K$=E$ THEN 220
640 T=INT(VAL(T$))
650 IF T<0 OR T>9999 THEN SOUND 200,1:GOTO 220
660 LOCATE 18,16:PRINT S$(2)
670 IT=T:LOCATE 18,16:PRINT IT:GOTO 220
680 H$="FILENAME:":T$="":GOSUB 5000
690 IF T$="" THEN 220 ELSE F$=T$
700 ON ERROR GOTO 1190
710 IF SEL=9 THEN 1140
720 OPEN F$ FOR INPUT AS #1
730 FOR L=1 TO 12:INPUT#1,A$(L)
740 INPUT#1,DV(1,L),DV(2,L),DV(3,L):NEXT L
750 FOR L=1 TO 3:INPUT#1,SN$(L):NEXT L:INPUT#1,IT
760 CLOSE#1:ON ERROR GOTO 0:CX=1:CY=1:GOSUB 8000
770 LOCATE 18,16:IF IT>0 THEN PRINT IT:GOTO 470
780 PRINT S$(2):GOTO 470
790 LOCATE 22,1:PRINT "<Esc> <D>ate <N>ame <W>eight"
800 GOSUB 6000:SS=INSTR(E$+"DNW",K$)-1
810 IF SS<0 THEN SOUND 100,2:GOTO 800
820 LOCATE 22,1:PRINT BL$:IF SS=0 THEN 220
830 H$=TT$(SS)+":":T$=SN$(SS)
840 GOSUB 5000:IF K$=E$ THEN 790
850 SN$(SS)=T$:GOTO 790
860 SOUND 200,1:ON ERROR GOTO 1070:LOCATE 20,1
870 PRINT "Press <SPACE BAR> when printer ready.";
880 GOSUB 3000:IF K$<>E$ AND K$<>SP$ THEN 880
890 LOCATE 20,1:PRINT BL$:IF K$=E$ THEN 220
900 LPRINT TAB(32);"CALORIE CALCULATOR"
910 LPRINT:FOR L=1 TO 3
920 IF SN$(L)<>"" THEN LPRINT TT$(L);": ";SN$(L)
930 NEXT L:LPRINT:LPRINT DA$;DA$
940 LPRINT TAB(68);"CALORIES"
950 LPRINT TAB(5);"#";TAB(17);"ACTIVITY";TAB(46)"CBPM"
;
960 LPRINT TAB(55);"MINUTES";TAB(70);"BURNED"
970 LPRINT DA$;DA$:FOR L=1 TO 12
980 LPRINT TAB(4);N$(L);SP$;SP$;A$(L);:FOR M=1 TO 3
990 IF DV(M,L)<>0 THEN LPRINT TAB(33+12*M);USING PF$(M
+1);DV(M,L);
1000 NEXT M:LPRINT:NEXT L:LPRINT DA$;DA$
1010 LPRINT TAB(18);"TOTAL";TAB(57);USING PF$(3);MT;
1020 LPRINT TAB(69);USING PF$(4);CT:LPRINT DA$;DA$
1030 LPRINT "CALORIE INTAKE:";IT;
1040 T=INT(IT-CT):T$=STR$(T):IF T<0 THEN T$=SP$+T$
1050 LPRINT TAB(72-LEN(T$));"NET:";T$
1060 LPRINT DA$;DA$:GOTO 220
1070 SOUND 200,1:RESUME 1080
1080 LOCATE 20,1:GOTO 870
1090 SOUND 400,2:LOCATE 20,1
1100 PRINT "Press <Y> to exit or <Esc> to continue.";
1110 GOSUB 7000:IF K$<>"Y" AND K$<>E$ THEN 1110
1120 LOCATE 20,1:PRINT BL$
1130 IF K$="Y" THEN CLS:KEY ON:END ELSE 220
1140 OPEN F$ FOR OUTPUT AS #1
1150 FOR L=1 TO 12:WRITE#1,A$(L)
1160 WRITE#1,DV(1,L),DV(2,L),DV(3,L):NEXT L
1170 FOR L=1 TO 3:WRITE#1,SN$(L):NEXT L
1180 WRITE#1,IT:CLOSE#1:ON ERROR GOTO 0:GOTO 220
1190 CLOSE#1:SOUND 700,1:LOCATE 20,1
1200 PRINT "Check disks/drive; then press any key.";
1210 GOSUB 3000:RESUME 1220
1220 ON ERROR GOTO 0:LOCATE 20,1:PRINT BL$:GOTO 220
2000 LOCATE 3+CY,XP(CX):IF DM THEN COLOR 0,2
2010 IF CX>1 THEN 2040
2020 T$=A$(CY):IF T$="" THEN PRINT S$(CX):GOTO 2060
2030 PRINT T$+SPACE$(20-LEN(T$)):GOTO 2060
2040 T=DV(CX-1,CY):IF T=0 THEN PRINT S$(CX):GOTO 2060
2050 PRINT USING PF$(CX);T
2060 IF DM THEN COLOR 2,0
```

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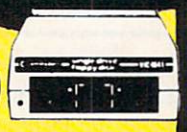

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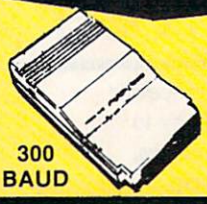

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```
2070 RETURN
3000 LOCATE ,,1
3010 K$=INKEY$:IF K$="" THEN 3010
3020 LOCATE ,,0:RETURN
4000 CT=0:MT=0:LOCATE 16,20:PRINT S$(1)
4010 LOCATE 18,26:PRINT S$(5):RETURN
5000 HL=LEN(H$)+2:LT=LEN(T$)
5010 LOCATE 20,1,1:PRINT H$;SP$;T$;SP$
5020 LOCATE 20,HL+LT:GOSUB 3000:IF LEN(K$)=1 THEN 5040
5030 IF INSTR("KMPH",RIGHT$(K$,1))=0 THEN 5020 ELSE 51
10
5040 IF K$=E$ AND T$="" THEN 5110
5050 IF K$=E$ THEN LOCATE 20,1:PRINT BL$:T$="":LT=0:GO
TO 5010
5060 IF K$=R$ THEN 5110
5070 IF K$=CHR$(8) AND LT>0 THEN T$=LEFT$(T$,LT-1):LT=
LT-1:GOTO 5010
5080 IF K$<SP$ THEN 5020
5090 IF LT=20 THEN SOUND 200,1:GOTO 5020
5100 LT=LT+1:T$=T$+K$:PRINT K$;:GOTO 5020
5110 LOCATE 20,1,0:PRINT BL$:RETURN
6000 LOCATE 20,1:GOSUB 7000:RETURN
7000 GOSUB 3000:K=ASC(K$)
7010 K$=CHR$(K-32*(K>96)*(K<123)):RETURN
8000 TX=CX:TY=CY:DM=0
8010 FOR CY=TY TO 12:FOR CX=1 TO 4:GOSUB 2000
8020 NEXT CX,CY:CX=TX:CY=TY:RETURN
9000 DATA 20,3,N,5,23,###.#,5,28,#####,7,33,#######
9010 DATA DATE,NAME,WEIGHT
```

COMPUTERS WE COVER

We regularly present two or more programs in each issue for the Apple II series; Atari 400/800, 600/800XL, & 130XE; Commodore 64 & 128 (in C 64 mode); IBM PC and compatibles; and Color Computer. However, occasionally we have to omit versions when a program requires capabilities that some of these computers lack. For example, many Microtones programs can only run on computers that have three voices, which eliminates the Apple II series; IBM PC and compatibles (except the PC*jr* with Cartridge BASIC and the Tandy 1000); and Tandy Models III, 4, and Color Computer.

In addition, we publish at least one program each issue for the Adam, Macintosh, Tandy Models III/4, TI-99/4A, and VIC-20. In the future, we also hope to cover the Atari 520ST and the Amiga. This month, these programs can be found here in The Programmer and in Compucopia (in the K-POWER section of FAMILY COMPUTING).

CIRCLE READER SERVICE 37

FUNCTION KEYS IN YOUR BASIC PROGRAMS

A TUTORIAL FOR INTERMEDIATE PROGRAMMERS

BY JOEY LATIMER

Many computers have special keys that, unlike other keys, normally have no effect when pressed. These keys are usually called "function keys" because they can be programmed to carry out preassigned functions. In a game program, for instance, you may be instructed to press a key called F1 or START to begin the game. In a word processor, you may be called upon to press a specific function key when you want to change the screen to a different color. Function keys can be assigned almost any task by creating programming routines that are activated each time a certain function key is pressed.

While most computer manuals don't deal with the programming of function keys, it can be a very useful technique and is relatively easy for most programmers to master.

The following tutorial discusses the programming of function keys for Atari, Commodore 64 and 128, IBM PC and compatible, and Tandy Model 4 computers. In order to get the most out of this tutorial, you should first have a basic understanding of the use of GOSUB, GOTO, IF . . . THEN, and PRINT statements. In addition, Atari and Commodore owners should be familiar with GET, PEEK, and POKE, and owners of PC compatibles and Model 4s should know the INKEYS command.

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Once you understand how the program for your computer works, try modifying it so that when a function key is pressed, the program performs some other function or jumps to your own routine.

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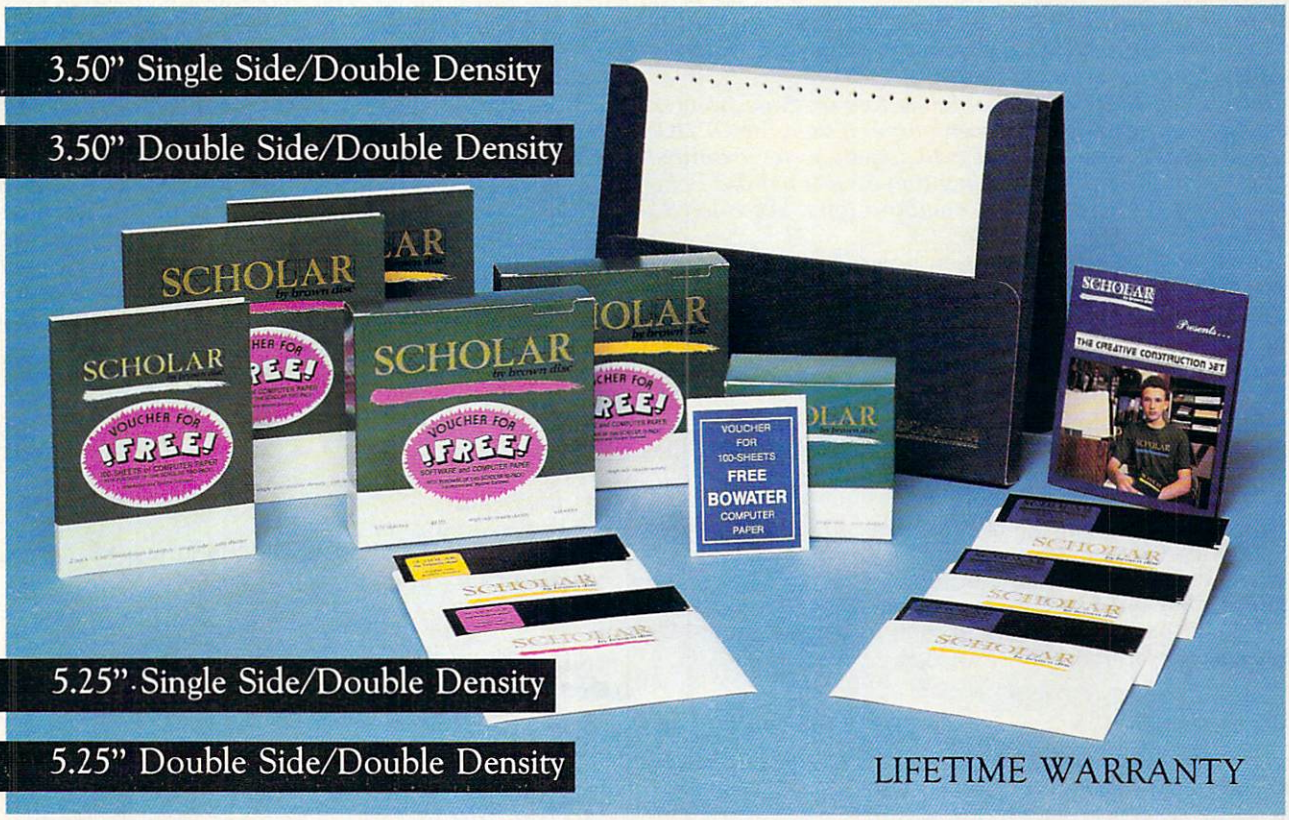

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CIRCLE READER SERVICE 11

keys that can be used in your BASIC programs. These keys are called OPTION, SELECT, and START.

The normal way of checking to see if a key has been pressed is to PEEK, or check, the value in memory location 764. When "Q" is pressed, PEEK(764) has the value 47 (see line 60). Unfortunately, pressing a function key doesn't affect the value of PEEK(764).

To check for a function key, PEEK memory location 53279 (see line 70). If the value found in memory location 53279 is 3, then the OPTION key is being pressed. If the value is 5, then SELECT is being pressed. And if the value is 6, then START is being pressed (see lines 80-140).

(NOTE: *The Atari can also detect two or three function keys being pressed at the same time. If both the OPTION and SELECT keys are pressed together, for example, then the value in memory location 53279 will be 1. For the values of the other key combinations, see lines 80-140.)*

Once a function key has been pressed, the color of the screen border is changed in line 110 by POKEing the value of K*10 into memory location 712. K is the value of the function key returned in line 70 (0 to 6), and the screen border is changed by POKEing 0 to 60 into location 712 (the range of legal values is 0 to 255).

If you want to jump to new program lines when function keys are pressed, then you will have to change lines 80-140 to read:

```
80 IF K=1 THEN (line number)
```

If you want to jump to subroutines, then lines 80-140 would look like this:

```
80 IF K=1 THEN GOSUB (line number of
subroutine) :GOTO 160
```

You can use the same technique to test for any of the other key combinations.

Atari 400/800, 600/800XL, & 130XE/*Function Key Demo*

```
10 PRINT CHR$(125):POSITION 4,1
20 PRINT "-FUNCTION KEY DEMO PROGRAM-"
30 PRINT :PRINT "PRESS ANY FUNCTION KEY"
40 PRINT "AND I WILL TELL YOU WHICH ONE"
50 PRINT "YOU PRESSED.  PRESS <Q> TO QUIT.":PRINT
60 IF PEEK(764)=47 THEN POKE 764,255:END
70 K=PEEK(53279)
80 IF K=0 THEN PRINT "<START>+<SELECT>+<OPTION>":GOTO
160
90 IF K=1 THEN PRINT "<SELECT>+<OPTION>":GOTO 160
100 IF K=2 THEN PRINT "<START>+<OPTION>":GOTO 160
110 IF K=3 THEN PRINT "<OPTION>":GOTO 160
120 IF K=4 THEN PRINT "<START>+<SELECT>":GOTO 160
130 IF K=5 THEN PRINT "<SELECT>":GOTO 160
140 IF K=6 THEN PRINT "<START>":GOTO 160
150 GOTO 60
160 POKE 712,K*10
170 IF PEEK(53279)=K THEN 170
180 GOTO 60
```

COMMODORE 64 AND 128 (C 64 MODE)

The C 64 has four physical function keys, labeled F1, F3, F5, and F7. If SHIFT is held down while these keys are pressed, then they become F2, F4, F6, and F8. This means that the C 64 keyboard acts as if it had eight different function keys.

The easiest way to check whether a function key has been pressed is to use the BASIC keyword GET (see line 60). When the computer executes the GET statement, it stores the value of any key currently being pressed in the specified string variable. In the demo program we call this string K$. Normally, we check whether a particular key has been pressed by comparing the value of K$ to the character, or key, we expect (e.g., IF K$="A" THEN . . .).

We check for function keys the same way. However, since the function keys don't have corresponding characters that display on the screen, we have to specify them by their ASCII values. The values for the function keys are 133 through 140. We convert these values to "characters" using the CHR$ (character string) function; and we compare K$ to every one of these special function-key characters in lines 90-160. (The ASCII values for every key are listed in the back of the programming manual that came with your C 64.)

If lines 90-160 establish that a function key has been pressed, then the number of the function key pressed (F1-F8) is displayed on the screen and the number of the function key is assigned to the variable FK. The value of FK is then POKEd into location 53280, which changes the color of the screen border (line 160). (The range of legal values for screen border color is 0 to 15.)

If you want to jump to another program line when F1 is pressed, then change line 70 to read:

```
70 IF K$=CHR$(133) THEN (line number)
```

If you want to jump to a subroutine when F1 is pressed, you can change line 70 to:

```
70 IF K$=CHR$(133) THEN GOSUB (line number of
subroutine) :GOTO 60
```

You can use the same technique to test for any of the other seven function keys.

Commodore 64 & 128 (C 64 mode)/*Function Key Demo*

```
10 PRINT CHR$(147)
20 PRINT TAB(6);"FUNCTION KEY DEMO PROGRAM"
30 PRINT:PRINT "PRESS ANY FUNCTION KEY"
40 PRINT "AND I WILL TELL YOU WHICH ONE"
50 PRINT "YOU PRESSED.  PRESS <Q> TO QUIT.":PRINT
80 GET K$:IF K$="Q" THEN POKE 53280,254:END
90 IF K$=CHR$(133) THEN PRINT "<F1>":FK=1:GOTO 180
100 IF K$=CHR$(134) THEN PRINT "<F3>":FK=3:GOTO 180
110 IF K$=CHR$(135) THEN PRINT "<F5>":FK=5:GOTO 180
120 IF K$=CHR$(136) THEN PRINT "<F7>":FK=7:GOTO 180
130 IF K$=CHR$(137) THEN PRINT "<F2>":FK=2:GOTO 180
140 IF K$=CHR$(138) THEN PRINT "<F4>":FK=4:GOTO 180
150 IF K$=CHR$(139) THEN PRINT "<F6>":FK=6:GOTO 180
160 IF K$=CHR$(140) THEN PRINT "<F8>":FK=8:GOTO 180
170 GOTO 80
180 POKE 53280,FK:GOTO 80
```

COMMODORE 128

The C 128 uses the function keys differently than the C 64. They can not be used to branch to a different part of a program as in the C 64. Instead, character strings are assigned to the function keys using the KEY command. After the keys have been assigned, pressing the function keys passes the strings to BASIC as if you had typed them at the keyboard. These keys can then be used to branch to a different line or subroutine if a certain string is received.

For example, to define F1 to your name you would type:

```
KEY 1,"YOUR NAME"+CHR$(13)
```

This method can be used to assign to the C 128 function keys the ASCII values of the C 64 function keys. This

can be done by adding the following lines to the C 64 program:

```
60 FOR X=1 TO 7 STEP 2:KEY X,CHR$(132+(X+1)/2)
70 KEY X+1,CHR$(136+(X+1)/2):NEXT X
```

IBM PC AND COMPATIBLES

Most PC compatibles have 10 function keys labeled F1 to F10. These keys are usually "active" when a BASIC program isn't running, with commands like RUN and LIST preassigned to them. In line 10, KEY OFF takes the preassigned key "signs" off the bottom of the screen to avoid confusion while the demo program is running.

In line 60 of the demo program, KEY(X) ON, where X is equal to 1 through 10, is used to tell the computer that the function keys, F1 to F10, will be used in the program. In lines 70 to 160, ON KEY(X) is used to tell the computer where to go if any of the function keys are pressed. The computer only needs to see these lines once in a program; thereafter, whenever a function key is pressed, the computer will know exactly where to go. For example, any time F1 is pressed, the computer will automatically execute the subroutine at 1000.

In the *Function Key Demo* program, when a function key is pressed the program jumps to a subroutine that prints the name of the function key and changes the color of the screen border using COLOR (see the subroutines in lines 1000-10000). (NOTE: *On computers with monochrome monitors, you will not see a color change.*) Unlike the Atari and C 64, which have the option of using GOTOs or GOSUBs, on the PC and compatibles the program MUST jump to a subroutine when a function key has been pressed. Try replacing the subroutines in the demo program with your own.

Lines 170 and 180 are a loop. Line 170 checks to see if some key other than a function key has been pressed. When a "Q" is pressed, the computer will reset the screen border color and then END. And when a function key is pressed, the computer will interrupt any other part of the program it happens to be working on and jump to the appropriate subroutine.

(NOTE: *This method can also be used for certain other key combinations besides the function keys. For more information, see the* ON KEY *and* KEY *statements in your BASIC manual.)*

The IBM PC and compatibles also let you use two-key combinations, such as SHIFT and F1 or ALT and F4, in your programs. Checking for these combinations is done using the INKEYS command instead of the ON KEY(X) command. For more information, look up Extended Codes in your BASIC manual.

The IBM PC and compatibles also give the ability to define any of the function keys as a string of up to 15 characters that will be acted upon by the computer just as if you had typed it on the keyboard yourself. For example, to make F1 print your name each time it is pressed, use the following command:

```
KEY 1,"YOUR NAME"+CHR$(13)
```

The CHR$(13) at the end tells the computer to "press the ENTER key" for you.

The operating system does not allow the use of both methods at the same time in a program. The KEY(X) ON command, line 60 of *Function Key Demo*, automatically turns off all of the pre-assigned definitions. The definitions will only be active after giving the computer a KEY(X) OFF command.

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IBM PC & compatibles/*Function Key Demo*

This program has been tested and found to work on the following computers and hardware configurations using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer card w/Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 CLS:KEY OFF
20 PRINT TAB(6);"-FUNCTION KEY DEMO PROGRAM-":PRINT
30 PRINT "Press any Function Key"
40 PRINT "and I will tell you which one"
50 PRINT "you pressed.  Press <Q> to quit.":PRINT
60 FOR X=1 TO 10:KEY(X) ON:NEXT X
70 ON KEY(1) GOSUB 1000
80 ON KEY(2) GOSUB 2000
90 ON KEY(3) GOSUB 3000
100 ON KEY(4) GOSUB 4000
110 ON KEY(5) GOSUB 5000
120 ON KEY(6) GOSUB 6000
130 ON KEY(7) GOSUB 7000
140 ON KEY(8) GOSUB 8000
150 ON KEY(9) GOSUB 9000
160 ON KEY(10) GOSUB 10000
170 K$=INKEY$:IF K$="Q" OR K$="q" THEN COLOR 7,0,8:END
180 GOTO 170
1000 PRINT "<F1>":COLOR 7,0,1:RETURN
2000 PRINT "<F2>":COLOR 7,0,2:RETURN
3000 PRINT "<F3>":COLOR 7,0,3:RETURN
4000 PRINT "<F4>":COLOR 7,0,4:RETURN
5000 PRINT "<F5>":COLOR 7,0,5:RETURN
6000 PRINT "<F6>":COLOR 7,0,6:RETURN
7000 PRINT "<F7>":COLOR 7,0,7:RETURN
8000 PRINT "<F8>":COLOR 7,0,8:RETURN
9000 PRINT "<F9>":COLOR 7,0,9:RETURN
10000 PRINT "<F10>":COLOR 7,0,10:RETURN
```

TANDY MODEL 4

The Tandy Model 4 has three function keys, labeled F1, F2, and F3. The familiar INKEY$ statement, normally used to check for standard keys, can also check to see if one of these three function keys has been pressed.

In line 60, the computer stores the value of any key currently being pressed in a string variable named K$. Normally, we check whether a particular key has been pressed by comparing K$ to the character, or key, we expect. For example, in line 60, if K$ is equal to "Q", then the program ends.

We check for function keys the same way, except that, since the function keys don't have corresponding characters that display on the screen, we have to specify them by their ASCII values. The values for F1, F2, and F3 are 129, 130, and 131, respectively. In lines 70-90, we convert these values to "characters" using the CHR$ (character string) function; and we compare K$ to these special function-key characters. If a function key has been pressed, then the name of the function key is printed on the screen.

To jump to new line numbers when function keys are pressed, change lines 70-90 to:

```
70 IF K$=CHR$(129) THEN  (line number)
80 IF K$=CHR$(130) THEN  (line number)
90 IF K$=CHR$(131) THEN  (line number)
```

If you want to jump to subroutines when function keys are pressed, change lines 70-90 to read:

```
70 IF K$=CHR$(129) THEN GOSUB (line number of
subroutine) :GOTO 60
80 IF K$=CHR$(130) THEN GOSUB (line number of
subroutine) :GOTO 60
90 IF K$=CHR$(131) THEN GOSUB (line number of
subroutine) :GOTO 60
```

Tandy Model 4/*Function Key Demo*

```
10 CLS
20 PRINT TAB(16);"-FUNCTION KEY DEMO PROGRAM-"
30 PRINT:PRINT "PRESS ANY FUNCTION KEY"
40 PRINT "AND I WILL TELL YOU WHICH ONE"
50 PRINT "YOU PRESSED.  PRESS <Q> TO QUIT.":PRINT
60 K$=INKEY$:IF K$="Q" OR K$="q" THEN END
70 IF K$=CHR$(129) THEN PRINT "<F1>":GOTO 60
80 IF K$=CHR$(130) THEN PRINT "<F2>":GOTO 60
90 IF K$=CHR$(131) THEN PRINT "<F3>"
100 GOTO 60
```

TANDY MODEL 4 (MODEL III MODE)

The function keys on the Model 4 (Model III mode) can serve as "user-defined" keys to perform special functions. Once the keys have been assigned, the computer will react as if you typed the alternate key instead of the function key. In order to redefine the function keys, POKE the ASCII value of the character you want into the memory location of the function key.

To redefine F1, for example, to erase a line, type:

```
POKE 16875,10
```

To redefine F2 to ASCII 29, type:

```
POKE 16876,29
```

To redefine F3 to ASCII 28, type:

```
POKE 16883,28
```

This method can be used to move certain operations such as moving the cursor to the upper-left corner, to a function key instead of the three key combination of SHIFT, "↓" (down arrow), and "," (comma).

(NOTE: *The function keys will not act as "user-defined" keys when the Tandy Model 4 is in Model 4 mode.)*

PROGRAMMING P.S.

Corrections to Previous Months' Programs

Turkey Chase *(November 1986, page 76)*
Apple II series: Due to a printer's error, a colon in line 80 did not print clearly. The line should read as follows:

```
80 SP$ = CHR$(32):LI$ = SP$:FOR L = 2 TO 39
```

Numble *(December 1986, page 86)*
IBM PC & compatibles (80-column version): Just in case your computer is not in the 80-column mode when you run the program, you may want to add the following line:

```
20 WIDTH 80
```

The Twelve Days of Christmas *(December 1986, page 92)*
Apple II series: Due to a printer's error, a colon in line 100 did not print clearly. The line should read as follows:

```
100 FOR X = 1 TO 60:READ N(X),D(X):NEXT X:NP = 1
```

This Month!!

GAME STRATEGY, page 76
COMPUCOPIA, page 80
CONTEST, page 81

Edited by Bernadette Grey

POWER

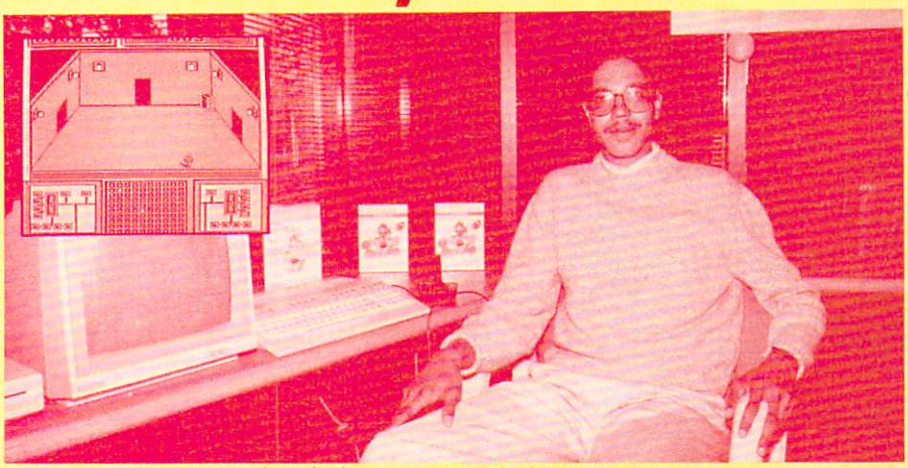
FOR THE COMPUTER GENERATION

Save the World With Second Guesser Page 80

Mailman Turned Hacker Wins Activision's *GameMaker* Design Contest and $5,000!!!

You are an intruder lost in a major compound that protects a master computer. Your mission: Wind your way through a maze of rooms in search of the main computer room and force a system shutdown before the master computer takes over the world. Along the way, you'll encounter patrol guards, intruder detectors, and computer lasers that can stop you from saving the world. Can you complete the mission before your deadline?

This exciting game, called *The Final Attempt*, is the creation of Cleophus W. Davis III, the grand-prize winner of Activision's *GameMaker* Design Contest. Activision held the contest last spring to see who could come up with the best game design using *GameMaker*, a program that allows you to integrate graphics, music, and animation to design your own arcade game. The submissions were judged by *GameMaker*'s designer, Garry Kitchen, and his staff. They evaluated the strategy, music, and graphics, and looked for entries that incorporated original work as well as the preprogrammed *GameMaker Library* of music and graphics choices. Cleophus used only one character (the explosion sprite) from the *Library* and programmed the rest himself. His music, characters, scenery, and control grid were all as original as his exciting game strategy.



Cleophus Davis with his prize-winning game, *The Final Attempt*.

Cleophus, a 27-year-old mailman from Hayward, California, became interested in computers more than two years ago when he received a C 64 for Christmas. Cleophus upgraded to a C 128 and his assortment of game software grew to a collection worth $2,000. He learned to program and played all types of computer games to gain a perspective on how they work and what makes them fun to play. All of this inspired Cleophus to design *The Final Attempt*, and now he is teaching himself assembly language to use in future programming projects.

Cleophus's devotion to gaming paid off. As the grand-prize winner of Activision's *GameMaker* Design Contest, he had his game published and spent a day at Activision. There, he got a grand tour of the software company, met with several software producers and designers, and attended a party in his honor. At the party, Activision President Jim Levy presented Cleophus with a check for $5,000! When asked what he would do with the money, Cleophus said, "I want to buy an Amiga, but I don't think my wife will go for it. We'll probably save the money and buy a house."—KAREN KANE

NOTE: *To receive a copy of* The Final Attempt, *send $5 to cover shipping and handling to GameMaker's Winning Disk, Activision, P.O. Box 7287, Mountain View, CA 94039.*

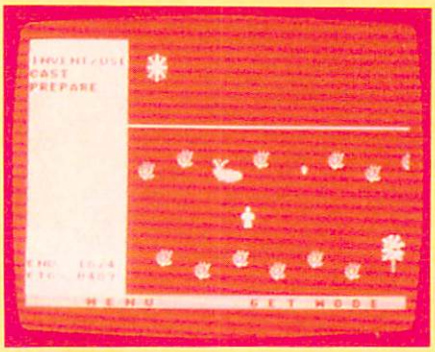
STRATEGY

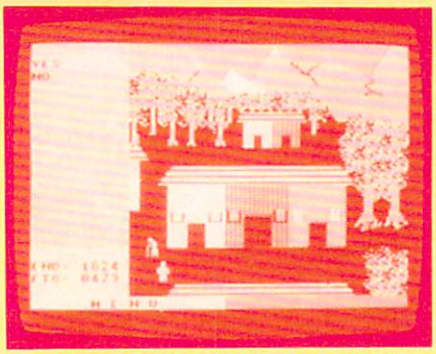
TIPS, TRICKS, AND HINTS

RINGS OF ZILFIN

SSI. Fantasy/Role-playing. Your mission: Locate and reunite the lost rings of Zilfin and rid the world of the evil wizard, Lord Dragos. *(The hints and game are for the Apple II series and C 64/128.)*

The beginning of the game can be very frustrating because a character's sword skill starts out so low. A fast and easy way to increase this ability is to shoot all monsters with your bow until they can be killed with one blow of your sword. (Sword skill doesn't automatically increase when you kill a villain with your sword, but it's worth your while to increase sword skill as much as possible because a sword can do far more damage than a bow.)





Should you fight or flee (top)? A helpful beggar (bottom)?

Purchase a suit of heavy armor early in the game. If you're wearing armor, the majority of monsters in Deloria can't touch you; this makes the first part of your quest much easier.

There are two ways to gather the 800 gold pieces necessary to buy heavy armor. You can travel back and forth from Telbiz to Ziad, looting the temples you find and picking mushrooms to keep your endurance up. (This is the slow way.) Here's a faster way: First, travel back and forth between Telbiz and Ziad until you have four Parzin and four Purlet mushrooms. Then, buy as much tobacco as you can from the merchant in Telbiz. Eat two of each mushroom and travel west through the Feldor Forest, battling the dreaded K-plants. (The mushrooms will give you an easy victory.) When you arrive in Perimon, sell all of your tobacco to the merchant, and you'll make a terrific profit. This journey can and should be repeated many times before you venture out into the rest of the forbidding world. After you have purchased the armor, you can make this same run for extra gold, toys, or a visit to the healers.

If you're using the Apple version, never try to kill the monsters that the night birds summon unless you're lucky and a very good shot. Flee and miss a night's sleep rather than wear yourself down against the magic of the flying monsters.

Beggars have interesting friends. A generous gift may loosen their tongues.

Do not even think of entering the Dark Tower or Castle Graz without the staff of the Grumm Tree.

On the first level of the Dark Tower, enter the passage on the right and follow the eastern wall. It will guide you past any monsters and through the door to the up staircase. On the second level, after leaving the room with the Fermigons, follow the second corridor leading south. Head east as soon as you can and stick close to the north wall. You'll find the door to the second staircase. Go up that staircase. On level three, go east from the first fork you find. Continue going north until there is a branch to the west. Follow this passage and turn north as soon as possible. This corridor will lead you to the door to the last staircase, which you'll go up. On level four, journey as far south as you can possibly go. Find a passage leading east near the bottom of the maze, and this will lead you to the room holding King Roland.

Be sure to buy some armor (top), and stay away from the K-plants (bottom)!!!!

In the entrance chamber of Castle Graz, go through the eastern exit and follow the corridor all the way to its end. Just before the dead end is a short western corridor: Head down it and turn south as soon as you are able. Go up the staircase. On the second level, move about one square south from the staircase. Follow the corridor all the way west. Then go all the way south and enter the passage on the south wall. This leads to the staircase. On level three, follow the passage east and then go north. Walk past the intersection via the east-west corridor and turn east at the next opportunity. On the fourth level, as soon as you exit the stairs, you'll see a long east-west corridor with many branches going south. Follow the second branch south, and midway down there will be an alcove on the left where Drago awaits.—JEFF DONAHUE, *18, Bronx, New York*

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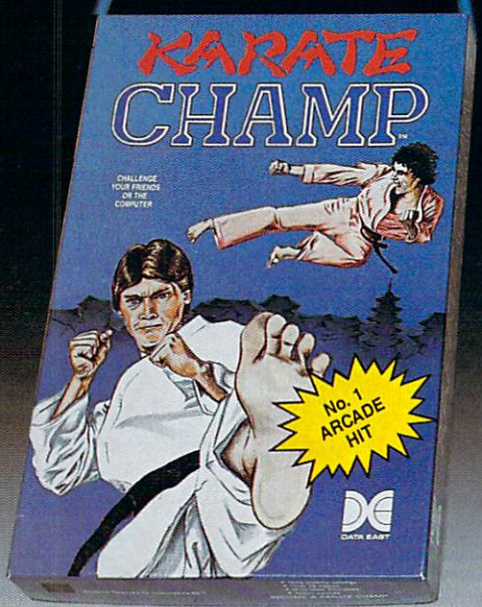
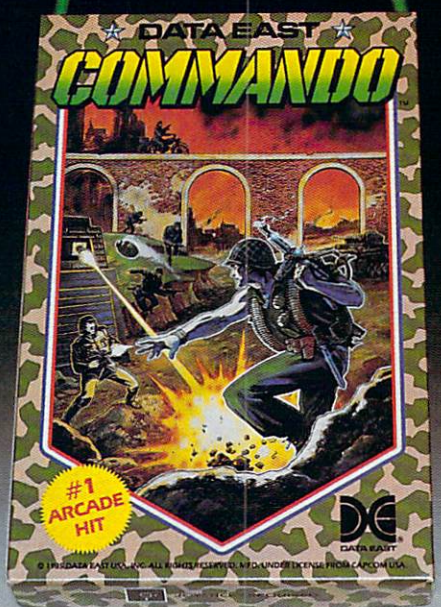
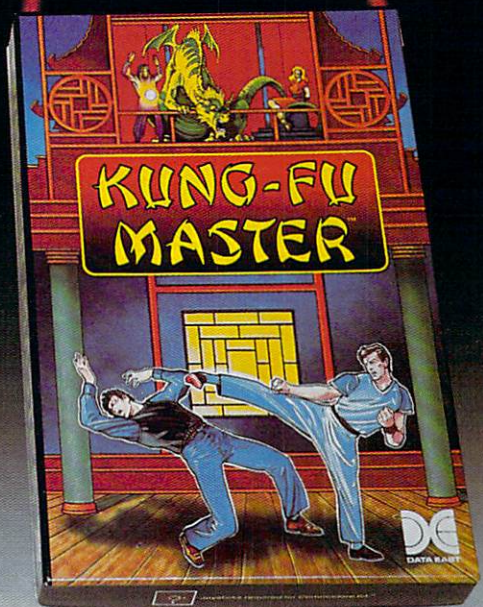


Put on your black belt and challenge your friends or the computer through nine picturesque settings in this leading Martial Arts Game to become the **KARATE CHAMP**. For the Commodore 64™/128 and the 48K Apple II® Series.



As the crack shot **COMMANDO,*** battle overwhelming odds to defeat advancing rebel forces. Armed with only a machine gun and hand grenades, you must break through the enemy lines to reach the fortress. For the Commodore 64™/128.



Prepare for the fight of your life . . . you are the **KUNG-FU MASTER.**** Battle the evil forces through the five dangerous floors in the wizard's castle to rescue the captive fair maiden. For the Commodore 64™/128 and the 48K Apple II® Series.

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** © Irem Corp. Mfd. under license by Data East USA, Inc.

DATA EAST

CIRCLE READER SERVICE 17

DATA EAST USA, INC.
470 Needles Drive, San Jose, California 95112
(408) 286-7074

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TRINITY

Infocom. Text adventure. Your mission: Escape World War III by entering a strange dimension and save the world. *(The hints and game are for Amiga, Apple, Atari, C 128, IBM PC & compatibles, and Macintosh.)*

- You can't walk across the grass, but if you roll . . .
- To keep rolling, you'll need a sail of some sort. A parasol might do nicely.
- White doors are a gateway to a different world.
- There is a vertex without a gnomon somewhere.
- The ring at the vertex opens and closes doors.
- A magpie can say only what it hears.
- To trap the skink between the lamp and the splinter, leave the lamp in the middle underground room and put the splinter in the crevice.
- Keep the skink in your pocket.
- Going through a pergola loop—or a Klein bottle—reverses directions (east=west).
- To get across the chasm, chop the tree and push it north.
- Can't open the crypt? Use a long lever.
- The corpse, if searched fully, will reveal everything needed to cross the river.
- A skeleton key can be found with a skeleton.
- You'll need water to cool off the magnet. You can carry water when it's frozen, but to keep it from melting, take it to the highest elevation.
- The only source of milk is the coconut. You can't get the coconut, but a friendly sea-dwelling mammal can.
- You can open the coconut with the axe.
- A bubble is a perfectly good spacesuit. Get in the soap dish.
- The magnet will get you home when you are in the bubble in outer space.
- Keep the lemming in the cage.
- If you give the little girl a gift, she will fold the rice paper into a magic bird.—THE SPECIAL Ks

HINT HOTLINE

AMAZON, Telarium, a division of Spinnaker (Apple, Atari ST, C 64, IBM PC & compatibles, Macintosh). Text/graphic adventure. Your mission: Explore the Amazon and find the lost city of Chak.

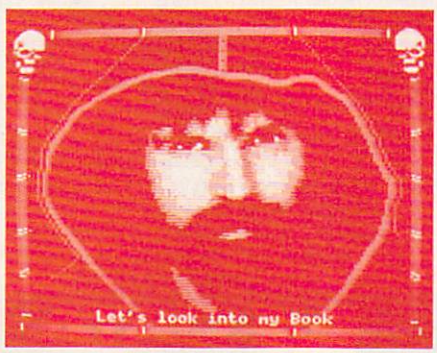
- When you are out in the river, hit the alligators with the oar to chase them away.
- When you get to the bridge, show the gun to Paco.
- You cannot take Paco across the bridge if he is tranquilized because he will go into convulsions. Instead, threaten to tranquilize him, and he will cooperate.
- Go east across the bridge and then go south until you get to a tree with skulls on it. Walk west from the tree and you should arrive at the entrance to the Lost City of Chak.

—KRIS BEELER, *11, Kent, Washington*; SCOTT FISHER, *16, Lyndon, Kansas*

THE PAWN, Rainbird, distributed by Firebird (Amiga, Apple [text only]; Atari ST, C 64/128, IBM PC & compatibles). Text/graphic adventure. Your mission: Discover why you have been brought to the mystical land of Kerovnia and find your way out.

- To get light: Cover the wrist band with your shirt before entering the guru's hut. There is water to the north, if you know what form to expect. After the guru gives you his advice, go to the clearing and see what's there.
- To get past the boulder, tie the rake to the hoe with your shirt. Level the boulder. However, the next rockpile must be overcome by different means.—JEREMY DOBRICK, *15, Wayne, Pennsylvania*

MOEBIUS, THE ORB OF CELESTIAL HARMONY, Origin Systems (Apple). Strategy/Role-playing. Your mission: Defeat the evil Kaimen using your martial arts and swordsmanship skills.



- Aim high at warlords; it's your only chance.
- When traveling in the jungle, always have your sword ready to swing at tigers and tall grass. But when you're inside the fortress, put it away, because karate works better.
- When night falls, get behind a locked door. But do look out, because assassins throw shurikens over walls.
- Watch out for guards and assassins that come out of the water.—MICHAEL MINNICH, *11, Arlington, Virginia*

We're looking for a few good hints! Send us hints for your favorite games, and, if we publish them, we'll pay you $10. (We have all *The Bard's Tale, King's Quest I* and *II, Wizardry*, and *Ultima I, II, III*, and *IV* hints we can handle.) Send your hints to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY 10003. Sorry, but because we get so much mail, we can't acknowledge your letters unless we decide to publish your hints.

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ming, diving, gymnastics and skeet shooting, just to name a few.

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Finally, there's the icy challenges of *Winter Games.*™ Wait'll you careen the tube in a bobsled. Fly the ski jump. Or choreograph an entire figure skating routine. You'll flip out over the hot dog aerials. And beg for mercy in the Biathlon. And coming next summer, our newest Games program. (Better get ready to hit the beach.)

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Over 30 of them, to be specific.

They're the unforgettable events of our best-selling Games series.

First, *World Games.*™ Eight international events ranging from Sumo wrestling to cliff diving. Bull riding to weightlifting. Even skiing the Chamonix slalom.

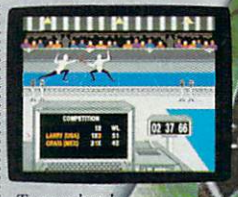
There's our enormously popular *Summer Games.*® Break records in track, swim-

Sumo wrestling. A sport of ritual and tradition.

Gymnastics. A graceful display of balance, poise and concentration.

The Bobsled. One wrong move and it's right down the tube.

Cliff Diving. In Acapulco, everyone falls for it.



Try your hand at Fencing.

Ride a bucking bull.

1 To 8 players. Amiga, Apple II & compatibles, Atari ST, C64/128, IBM & compatibles. Coming for the Apple IIGS.

1 To 8 players. Apple II & compatibles, Atari, C64/128.

1 To 8 players. Apple II & compatibles, C64/128, IBM & compatibles.

1 To 8 players. Amiga, Apple II & compatibles, Atari ST, C64/128, IBM & compatibles, Macintosh.

EPYX®

CIRCLE READER SERVICE 20

COMPUCOPIA

SHORT PROGRAMS BY STEVEN C. M. CHEN

SECOND GUESSER

You are Captain Quirk of the starship Extrafries. Enemy Stickons have devised a scheme to destroy the entire universe. Fate is in your hands, and the only chance you have of countering the attack is to activate a neutralizer shield at the exact second they charge. Luckily, you have the *Second Guesser* program, which can tell you how many seconds away the universe is from the wrath of the Stickons, but you can't find Mr. Clock or a stopwatch.

To save the universe, type in and RUN the *Second Guesser* program and try to *count out* the number of seconds printed at the top of the screen. Begin your countdown when the word Go!!! appears and press the space bar to activate the shield. If you are more than half a second off, the universe will be destroyed. Count carefully—and live long and prosper! —K.K.

APPLE II SERIES/*SECOND GUESSER*

```
10 HOME:TM = INT(RND(1)*21)+10
20 PRINT TAB(11);TM;"-SECOND GUESSER":PRINT
30 PRINT TAB(16);"GET READY.":VTAB 23:HTAB 4
40 PRINT "PRESS ANY KEY TO ACTIVATE SHIELD."
50 TC = TM*68:FOR D = 1 TO 300+RND(1)*300:NEXT D
60 VTAB 3:HTAB 1:CALL -868:POKE -16368,0
70 VTAB 6:HTAB 18:PRINT "GO!!!":C = 0
80 IF PEEK(-16384) > 127 THEN 100
90 C = C+1:GOTO 80
100 HOME:POKE -16368,0
110 PRINT "YOU GUESSED ";C/68;" SECONDS.":PRINT
120 IF ABS(TC-C) > 34 THEN 140
130 PRINT "YOU SAVED THE UNIVERSE!":END
140 PRINT "THE UNIVERSE IS DESTROYED.":END
```

ATARI 400/800, 600/800XL, & 130XE/*SECOND GUESSER*

```
10 DIM L$(30),SP$(1):OPEN #1,4,0,"K:"
20 POKE 752,1:SP$=CHR$(32)
30 L$(1)=SP$:L$(30)=SP$:L$(2)=L$:TM=INT(RND(1)*21+10)
40 PRINT CHR$(125);L$(1,11);TM;"-SECOND GUESSER":PRINT
50 PRINT L$(1,15);"GET READY!":POSITION 3,22
60 PRINT "PRESS ANY KEY TO ACTIVATE SHIELD."
70 FOR D=1 TO 150+RND(1)*150:NEXT D
80 POSITION 1,2:PRINT L$:POKE 764,255
90 POSITION 17,5:PRINT "GO!!!"
100 POKE 18,0:POKE 19,0:POKE 20,0
110 IF PEEK(764)=255 THEN 110
120 C=(PEEK(20)+PEEK(19)*256+PEEK(18)*65536-10)/60
130 PRINT CHR$(125);"YOU GUESSED ";C;" SECONDS.":PRINT
140 IF ABS(TM-C)>0.5 THEN 160
150 PRINT "YOU SAVED THE UNIVERSE!":GOTO 170
160 PRINT "THE UNIVERSE IS DESTROYED."
170 GET #1,K:POKE 752,0:POKE 765,255:POSITION 0,10:END
```

COMMODORE 64 & 128 (C 64 MODE)/*SECOND GUESSER*

```
10 TM=INT(RND(1)*21)+10:CL$=CHR$(32)
20 FOR L=2 TO 10:CL$=CL$+CHR$(32):NEXT L
30 PRINT CHR$(147);TAB(10);STR$(TM);"-SECOND GUESSER"
40 PRINT:PRINT TAB(14);"GET READY."
50 POKE 214,22:PRINT
60 PRINT TAB(2);"PRESS ANY KEY TO ACTIVIVATE SHIELD."
70 FOR D=1 TO 350+RND(1)*350:NEXT D
80 POKE 214,1:PRINT:PRINT TAB(14);CL$
90 POKE 214,3:PRINT:PRINT CHR$(5)
100 PRINT TAB(17);"GO!!!";CHR$(154):TIME$="000000"
110 GET K$:IF K$="" THEN 110
120 C=TIME/60
130 PRINT CHR$(147);"YOU GUESSED";C;"SECONDS.":PRINT
140 IF ABS(TM-C)>0.5 THEN 160
150 PRINT "YOU SAVED THE UNIVERSE!":END
160 PRINT "THE UNIVERSE IS DESTROYED.":END
```

IBM PC & COMPATIBLES/*SECOND GUESSER*

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer Card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 DEF SEG=&H40:V=PEEK(&H10) AND 48:DEF SEG
20 KEY OFF:IF V=32 THEN WIDTH 40:LM=0 ELSE LM=20
30 RANDOMIZE TIMER
40 CLS:TM=INT(RND*21)+10:COLOR 15,0
50 PRINT TAB(LM+11);STR$(TM);"-SECOND GUESSER"
60 COLOR 14:PRINT:PRINT TAB(LM+16);"Get Ready."
70 COLOR 2:LOCATE 23,LM+4
80 PRINT "Press any key to activate shield."
90 FOR D=1 TO 600+RND*600:NEXT D
100 LOCATE 3,LM+16:PRINT STRING$(10,32)
110 LOCATE 6,LM+18:PRINT "GO!!!":C=TIMER
120 K$=INKEY$:IF K$="" THEN 120 ELSE C=TIMER-C
130 CLS:PRINT "You guessed";C;"seconds.":PRINT
140 IF ABS(TM-C)>.5 THEN 160
150 PRINT "You saved the universe!":GOTO 170
160 PRINT "The universe is destroyed."
170 LOCATE 10,1:KEY ON:END
```

MACINTOSH W/MICROSOFT BASIC 2.0 OR 2.1/*SECOND GUESSER*

```
    WINDOW 1,"SECOND GUESSER",(0,38)-(527,338)
    CLS:RANDOMIZE TIMER:TM=INT(RND*21)+10
    PRINT TAB(25);STR$(TM);"-SECOND GUESSER"
    PRINT:PRINT TAB(29);"Get Ready.":LOCATE 16,21
    PRINT "Press any key to activate shield."
    FOR D=1 TO 900+RND*900:NEXT D
    LOCATE 3,29:PRINT STRING$(10,32):TEXTSIZE 42
    LOCATE 2,9:PRINT "GO!!!":C=TIMER
  KEYPRESS:
    K$=INKEY$:IF K$="" THEN KEYPRESS
    C=TIMER-C:TEXTSIZE 12
    CLS:PRINT "You guessed";C;"seconds.":PRINT
    IF TM=C THEN PRINT "You saved the universe!":GOTO
DELAY
    PRINT "The universe is destroyed."
  DELAY:
    FOR D=1 TO 8000:NEXT D:END
```

TANDY COLOR COMPUTER/*SECOND GUESSER*

```
10 CLEAR 200:CLS:TM=RND(21)+9:CL$=CHR$(32)
20 FOR L=2 TO 10:CL$=CL$+CHR$(32):NEXT L
30 PRINT TAB(7);STR$(TM);"-SECOND GUESSER"
40 PRINT TAB(44);"GET READY."
50 PRINT@419,"PRESS ANY KEY TO ACTIVATE"
60 PRINT@461,"SHIELD."
70 TC=TM*96:FOR D=1 TO 200+RND(200):NEXT D
80 PRINT@76,CL$:PRINT@206,"GO!!!":C=0
90 K$=INKEY$:IF K$<>"" THEN 110
100 C=C+1:GOTO 90
110 CLS:PRINT "YOU GUESSED";C/96;"SECONDS.":PRINT
120 IF ABS(TC-C)>48 THEN 140
130 PRINT "YOU SAVED THE UNIVERSE!":END
140 PRINT "THE UNIVERSE IS DESTROYED.":END
```

MAIL US A MASTERPIECE

ILLUSTRATION BY J. D. KING

K-POWER's editor and the SPECIAL K trio (Jeff, Greg, and Sasha) get so much mail from readers that some visitors mistake the FAMILY COMPUTING offices for the local post office. Mail boxes, desks, chairs, shelves, and the floor are piled high with all sorts of fun letters from all types of entertaining people.

There's only one thing boring about the mail they get. The envelopes!! **Judy Ihlenfeldt**, of Waterloo, Indiana, decorates her envelopes (she sends lots of mail) with frog and owl stickers, and a few other readers brighten up their mail with colorful drawings. But, for the most part, the envelopes that K-POWER gets are dull, boring, and repetitious. Just looking at the white mountains of envelopes makes the mailman yawn.

Here's a challenge for you. For this month's contest, your mission is to liven up the FAMILY COMPUTING office by decorating an envelope with a computer-related drawing! It's a weird idea for a contest—but what a blast!! Draw, scribble, paint, print, or do whatever on your contest-entry envelope. Be creative. Be crazy. Help the K-POWER clan look forward to its mail. Send your legible envelope entries (enclose the contest entry below) to K-POWER, 730 Broadway, New York, NY 10003, before March 31. Don't get too carried away and scribble across our address because the mailman won't deliver your letter! The SPECIAL Ks will award $10 apiece for the three envelopes they like most.

Name_____ Birthdate _____

Address _____

City _____ State _____ Zip _____

What computer(s) do you own (make and model)? _____

What do you like most about K-POWER? _____

_____

_____

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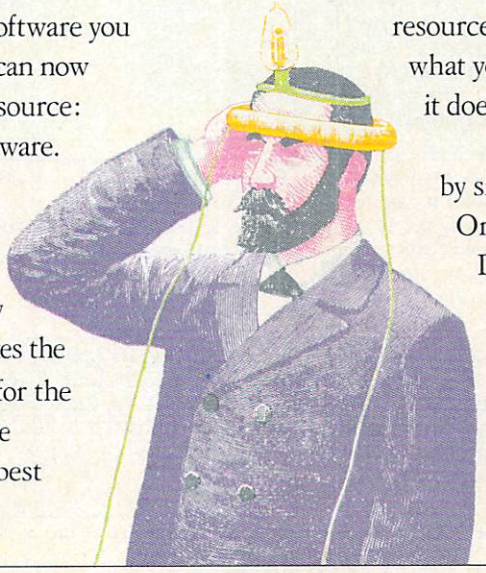

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CIRCLE READER SERVICE 57

SOFTWARE GUIDE

SPECIAL: A CHANGE IN THE RATINGS

Welcome to FAMILY COMPUTING's Software Guide. We have a special announcement for this issue: A revision in our ratings formula. Up to now, our software evaluations have spanned a range of four levels—poor, average, good, and excellent—in all but one of the categories below (not in "Ease of use"). Now we're adding a fifth level: very good.

With this revised system, you'll most probably be seeing fewer good and excellent ratings, since the addition of a very good rating was designed to accommodate qualities that are better than good, but are not quite excellent.

Here's how the new rating system works:

★★★★ Excellent. Outstanding. Truly superior.
★★★ Very Good. Of high quality.
★★ Good. Well-done, with few flaws.
★ Average. We've seen better, we've seen worse.
○ Poor. An empty circle, for not much there.

EDUCATION/FUN LEARNING

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
THE NEW GAME SHOW Advanced Ideas Inc. 2902 San Pablo Ave. Berkeley, CA 94702 (415) 526-9100 $35-$40 ©1986	Mimics a typical TV quiz show. Working with clues from dozens of topics—money, primates, and U.S. presidents are but a few—you identify a target word. A fun way to reinforce learning. —FRANK	Reviewed on 64K Apple. Also for C 64/128, IBM PC/PC*jr.** Color monitor recommended.	1-year warranty. $10 thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
NUTRITION WIZARD Center for Science in the Public Interest 1501 Sixteenth St., NW Washington, DC 20036 (202) 332-9110 $100 ©1986	Aids the growing concern with proper diet by letting you assemble complete nutritional totals for recipes, meals, and daily diets, all tailored for an individual's age, size, and activity. Add your own foods, too. —RASKIN	IBM PC/PC*jr.** 2nd drive. Printer recommended.	30-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★
STICKYBEAR MUSIC Weekly Reader Family Software 245 Long Hill Road Middletown, CT 06457 (203) 638-2400 $40 ©1986	Here's Stickybear! He wants to help you compose and play your own music, and he's carrying a small library of songs on disk, too. You'll enjoy it if you're a beginner (ages 7+), but you'll quickly reach limitations. —FRANK	Apple.	90-day warranty. $10 for backup.	★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★
TYPE! Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1185 $40-$50 ©1986	Not only does *Type!* teach you how to do just that, it also assesses your progress using graphs. With timed tests and a typing game, and an appeal to teenagers and adults.† —SUMMERS	Reviewed on IBM PC/ PC*jr.** Also for 64K Apple, C 64/128. 2nd drive optional.	90-day warranty. $7.50 thereafter.	★ ★ ★ ★	★ ★ ★	★ ★ ★ ★	★	E	★ ★ ★
WHERE IN THE U.S.A. IS CARMEN SANDIEGO? Broderbund Software (see above for address and phone) $45 ©1986	Carmen is back, along with her V.I.L.E. gang of 15 henchmen and women. Only this time, you track them down without going abroad. A delightful sequel that mixes fun and knowledge.† —MORRIS	Reviewed on 64K Apple. Also for C 64/128 and IBM PC/PC*jr.** Joystick optional.	90-day warranty. $7.50 thereafter.	★ ★ ★ ★	★ ★	★ ★ ★ ★	★ ★ ★	E	★ ★ ★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ○ Poor: ★ Average: ★★ Good: ★★★ Very Good: ★★★★ Excellent: N/A Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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Aim High. Be an Air Force Officer.

AIR FORCE

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
A-PLUS Savant Corporation P.O. Box 1077 Waltham, MA 02254 (617) 891-0638 $90 ©1984, 1986	Productivity for families, especially students (high school and up), in a word-processing and graphics package that integrates text and drawings (such as charts and maps). Remarkably good software.† —MORRIS	256K IBM PC.* Color graphics card. 2nd drive optional.	30-day warranty and money-back guarantee. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
FLASH Antic Publishing Inc. 524 Second St. San Francisco, CA 94107 (415) 957-0886 $40 ©1986	Convenience in a communications program means saving keystrokes (and therefore time and money) when on-line—and that's *Flash*. You can set up the function keys to perform up to 20 commands. —STERN	Atari ST. Modem.	90-day warranty. Not copy-protected.	★ ★ ★	★ ★	★	N/A	A	★ ★ ★ ★
MACMONEY Survivor Software Ltd. 11222 La Cienega Blvd. Inglewood, CA 90304 (213) 410-9527 $75 ©1986	Even if you're not experienced in accounting, you can begin both personal and small business financial recordkeeping and planning using *MacMoney*. On-line help is always available. —MANCINI	512K Macintosh. Printer recommended.	90-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★	E	★ ★ ★
THE NEWSROOM PRO Springboard Software 7808 Creekridge Circle Minneapolis, MN 55435 (612) 944-3915 $130 ©1986	The original *The Newsroom* program was written basically for personal use. Now here's a business version, with finer graphics and reproduction quality. Suitable for desktop publishing. —ELTGROTH	512K IBM PC,* 640K PC*jr*. 2nd drive recommended. Mouse, joystick optional.	30-day warranty. $5 thereafter. Not copy-protected.	★ ★ ★	★ ★ ★ ★	★ ★	★ ★ ★	E	★ ★ ★
PAPER CLIP II Batteries Included 30 Mural St. Richmond Hill, Ontario L4B 1B5, Canada (416) 881-9941 $80 ©1986	Offers several advancements over the C 64 version of this word processor, such as a full communications module and more complex macros. It took me a while to learn all the commands, but it was worth the effort. —ZORNBERG	C 128. 2nd drive optional.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	D	★ ★ ★
PFS: PROFESSIONAL FILE Software Publishing Corp. 1901 Landings Drive Mountain View, CA 94043 (415) 962-8910 $249 ©1986	Makes data organization, entry, and retrieval as easy as possible without sacrificing important features. The on-line help is so good, you'll need the manual only the first time.† —MORGENSTERN	256K IBM PC.* 2nd drive.	90-day warranty. $15 thereafter. Not copy-protected.	★ ★ ★	★ ★ ★ ★	★ ★ ★	N/A	E	★ ★
POINT-TO-POINT Pinpoint Publishing 5901 Christie Ave. Emeryville, CA 94608 (415) 654-3050 $129 ©1986	With *AppleWorks*-like menus, this communications program makes it easy to go on-line and send and receive messages. Some flaws (the program hangs if a data disk is full), but quite helpful. —HALLERMAN	Reviewed on 128K Apple IIe/IIc. Also for Apple IIGS. Modem.	30-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★	N/A	E	★ ★
SMART MONEY Sierra On-Line Sierra On-Line Building Coarsegold, CA 93614 (209) 683-6858 $80 ©1986	Adequate account balancing and an automatic transactions feature help make this straightforward home accounting program one method of imposing organization on your financial affairs. —MORGENSTERN	Reviewed on IBM PC/ PC*jr*.* Also for 128K Apple IIe/IIc. 2nd drive.	90-day warranty. $10 thereafter. Not copy-protected.	★ ★	★ ★	★ ★	★	A	★ ★
VOLKSWRITER DELUXE PLUS Lifetree Software Inc. 411 Pacific St. Monterey, CA 93940 (408) 373-4718 $99 ©1985, 1986	Many features for a relatively low-cost word processor, such as a terrific built-in spelling checker (that's the "*Plus*") and mail-merge for inserting names and addresses as you print out. —MORRIS	256K IBM PC/PC*jr*.* 2nd drive.	60-day warranty and money-back guarantee. $20 thereafter. Not copy-protected.	★ ★ ★	★ ★ ★ ★	★ ★	N/A	A	★ ★ ★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ○ Poor: ★ Average: ★★ Good: ★★★ Very Good: ★★★★ Excellent: N/A Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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CIRCLE READER SERVICE 44

ENTERTAINMENT

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	PS	GQ	EU	V
ACE OF ACES Accolade 20833 Stevens Creek Blvd. Cupertino, CA 95014 (408) 446-5757 $30 ©1986	An aerial combat simulator that lets you choose from 1-4 arcade-style missions in W.W. II. Easy to fly, with superb sound effects and animation that help dramatize the action.† —ADDAMS	C 64/128. Joystick.	90-day warranty. $10 thereafter.	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
AMNESIA Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 $45 ©1986	Discover your own identity in this text-only adventure that sprawls across 4,000 locations in New York City. Written by author Thomas M. Disch, the result is interactive fiction's most literate work so far.† —ADDAMS	64K Apple.	90-day warranty. $7.50 thereafter.	★ ★ ★	★ ★ ★	★ ★	N/A	A	★ ★ ★
CHAMPIONSHIP WRESTLING Epyx, Inc. 600 Galveston Drive Redwood City, CA 94063 (415) 366-0606 $30-$40 ©1986	You (and up to seven of your friends) choose from eight bruisers and then match against each other or the computer. With 25 standard wrestling moves, practice sessions, and tournaments. —DELSON	Reviewed on C 64/128. Also for Apple IIe/IIc, Atari ST. Joystick(s).	90-day warranty. $5 thereafter.	★ ★	★ ★ ★	★ ★	★ ★ ★	A	★ ★
ENCHANTED SCEPTERS Silicon Beach Software 9580 Black Mountain Rd. San Diego, CA 92126 (619) 695-6956 $40 ©1984, 1985	What you hear is what you get as you play this swords-and-sorcery graphic adventure that features digitized sound effects that are among the best ever. A simple game that's for novices only. —ADDAMS	Macintosh.	90-day warranty. $5 thereafter.	★	★ ★	★	★ ★	E	★
HIGH ROLLER Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 $30 ©1986	Into the cockpit of a Harrier jet you go in this complex flight-and-combat simulator. This jet plane can take off, fly, and land vertically and diagonally. Hard to master, but fun to fly. —ADDAMS	C 64/128. Joystick recommended.	90-day warranty. $12.50 thereafter or for backup.	★ ★	★ ★ ★	★ ★ ★	★ ★	D	★ ★ ★
LUNAR EXPLORER Electric Transit 501 Marin St., #116 Thousand Oaks, CA 91360 (805) 373-1960 $40 ©1986	Orbit the moon and land on it. Explore the surface and participate in search-and-recover missions. Even see the Earth rise over the horizon in this challenging real-time simulation. —DELSON	Reviewed on Apple IIe/IIc. Also for IBM PC/PC*jr*.* Color graphics card (IBM). Joystick optional.	90-day warranty. $12 thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★	★ ★ ★	A	★ ★ ★
MURDER ON THE MISSISSIPPI Activision 2350 Bayshore Frontage Rd. Mountain View, CA 94043 (415) 960-0410 $35-$40 ©1986	Move about a vintage riverboat in this dandy text/graphic murder mystery that's easy to learn. You interview suspects and witnesses, collect evidence, and try to crack the dastardly case. —DELSON	Reviewed on 64K Apple. Also for C 64/128. Joystick optional.	90-day warranty. $7.50 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
STAR RAIDERS II Atari Corp. 1196 Borregas Ave. Sunnyvale, CA 94088 (408) 745-2000 $20 ©1985, 1986	There's plenty of edge-of-your-seat excitement in this sequel (of sorts) to the classic *Star Raiders*. Pilot a star fighter across the galaxy, and defend your planets against aliens. —DELSON	Atari 800/XL/XE. Joystick. Color monitor recommended.	90-day warranty. $10 thereafter.	★ ★ ★	★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★ ★
WORLD GAMES Epyx, Inc. (see above for address and phone) $30-$40 ©1986	You'll get an intensive workout with your joystick, playing these eight offbeat sports events, such as Acapulco cliff diving and sumo wrestling.† —ADDAMS	Reviewed on C 64/128. Also for Amiga, Apple, Atari ST, IBM PC/PC*jr*.*	90-day warranty. $5 thereafter.	★ ★ ★ ★	★ ★	★ ★ ★	★ ★ ★ ★	A	★ ★ ★
WORLD TOUR GOLF Electronic Arts (see above for address and phone) $50 ©1986	Highly detailed, visually exciting, and technically accomplished. These phrases describe a golf simulation that's by far the best yet. With a construction set option.† —DELSON	256K IBM PC. Color graphics card. Joystick optional.	90-day warranty. $7.50 thereafter.	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **PS** Play system; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 82 for information such as backup policies and addresses of software publishers.

EDUCATION/ FUN LEARNING

Type!

HARDWARE REQUIREMENTS: 64K Apple, C 64/128, IBM PC/PC*jr*.
PUBLISHER: Broderbund Software
PRICE: $40-$50
PUBLISHER'S SUGGESTED AGES: 12+

If you want to compute, you've got to type, but even an hour a day of "asdf jkl;" or "the quick brown fox" is more than most can stand. Fortunately, typing education has taken a turn for the better with boredom-free software called *Type!*

Beginners lead off with the Introducing the Keyboard and Keyboard Basics sections, which teach the home keys ("asdf jkl;") for each finger and let you practice. Each letter flashes when you're supposed to press it. The program lets you know when you should move on to the next lesson, but you can select your own pace if you prefer. Once you've absorbed the fundamentals, you move on to the Build Speed and Accuracy section. Finally, Special Exercises helps you smooth out rough spots in your technique. No matter what lesson you're on, *Type!* posts your average speed, accuracy percentage, goals, and problem areas. Our children especially liked seeing their best scores in lights at the end of each session.

An important part of learning is assessing your progress. *Type!* provides graphs that show you which fingers are weakest, which are most accurate, what kind of problems you're making most frequently, and so on. The program offers timed tests, too. You can enter your own text for any test, but with the entertaining selections provided, you may not want to. If you can't type fast enough to get to the end of the text in your allotted time, you won't find out the punch line to the story—an added incentive. Another incentive is packaged in Type!-Athlon, a typing game in which two animated characters race across the screen. The program stores high scores and test results so you can monitor your progress over a period of time.

Type! won't appeal to younger children, but teens and adults who want to compute more easily will find it much more entertaining than standard classroom drill.

—TAN A. SUMMERS

Where in the U.S.A. Is Carmen Sandiego?

HARDWARE REQUIREMENTS: 64K Apple.
PUBLISHER: Broderbund Software
PRICE: $45
PUBLISHER'S SUGGESTED AGES: 9+

Carmen Sandiego and her V.I.L.E. gang of 15 desperados are on the loose again, this time in the good old U.S. of A. Your job, as a rookie detective with the Acme Detective Agency, is to hunt them down, one at a time. Help is provided by clues, a map, Carmen's scrapbook, and a copy of Fodor's U.S.A. travel guide. The time it takes to uncover each clue is limited, so there's a premium on strategy as you travel here and there following up leads and collecting information. If you can't finish a game in one session, you can save it for later. Or you can play a new game each time you sign on, starting in a new place, with a new villain, new clues, and a new scenario. Successes bring promotions (you don't want to stay a rookie forever!), but be careful: If you catch up with a gang member without first obtaining an arrest warrant, she or he will escape, and all your labor will be lost. Also, if your warrant is for the wrong character, you may be charged with false arrest.

This delightful sequel to the best-selling *Where in the World Is Carmen Sandiego?* combines fun with learning as well as the original did, while you soak up lots of facts about the United States. The documentation is brief, though, and our kids had to learn some of the rules and strategy by trial and error, but those are easily ignored flaws in an otherwise excellent and challenging educational game.

—TONY MORRIS

HOME BUSINESS & PRODUCTIVITY

A-Plus

HARDWARE REQUIREMENTS: 256K IBM PC.
PUBLISHER: Savant Corporation
PRICE: $90

Listen to comments from my teenagers:

"Best program I've ever seen."

"Incredible graphics!"

"Easy to use, and fun, too."

From such accolades, you might suspect that they were playing the latest high-res action game, but they were talking about *A-Plus*, an integrated word-processing and graphics package designed especially for family use.

Reasons for enthusiasm are not hard to find. The word-processing portion is tailored to high-school and college students, featuring such items as special character sets for Spanish, French, German, Italian, Greek, and mathematics/physics characters. Your files are arranged in "three-ring binders," and up to 50 binders and 300 files can be stored on a disk. For the beginner, icons and menus are available; but as you become more adept, you can substitute a full set of faster, one-letter

commands. Other desirable features include an Undo function that reverses your most recent action. To help you avoid major disasters, backup files are automatically created whenever a file is deleted or modified.

And there's more. Not only a fine word processor, *A-Plus* is also a cursor-driven graphics program that permits freehand drawing as well as offering a clip-art library of 100 illustrations on disk. Drawings can be embellished with brush strokes, a pixel-by-pixel zoom mode, various fill patterns, and an optional background grid to aid in preparing graphs and charts.

And there's more. All drawings can be inserted into documents written on the word processor. Thus, graphs, charts, maps, and the like can be scaled down to an appropriate size and either printed on separate pages or placed alongside your text. (Words will wrap around the illustrations automatically.) This is a great feature for science or sociology reports, geography papers, and similar projects.

And there's more. Let's list the extras: a clock (with optional alarm), a calendar (with past, present, and future dates), and a five-function calculator (including square roots). Data from these three modules can also be incorporated into documents written with the word processor.

On the negative side, there's no spelling checker, and printing detailed graphics takes time ("but they were well worth the wait," according to 15-year-old Matt). Yet, these are trivial criticisms of an otherwise outstanding software package. As 18-year-old Anne noted, "I've never seen a word processor that is so thorough and easy to use at the same time."

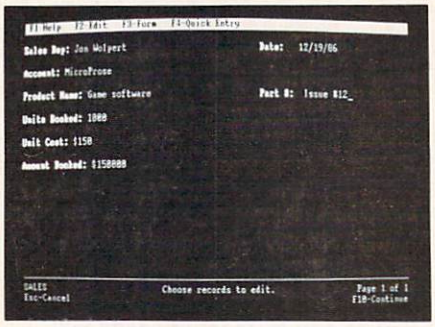
And there's more. —TONY MORRIS

PFS: Professional File

HARDWARE REQUIREMENTS: 256K IBM PC.
PUBLISHER: Software Publishing Corp.
PRICE: $249

If you want a business-quality data base that won't take forever to master, *PFS: Professional File* could be for you.

The philosophy behind this program is clear: Let the user do pretty much what he or she wants to do, and offer help every step of the way. Take form design, for instance. You move your cursor around the screen and type in the names of the fields (categories) you want, ending each with a colon. Any field can be up to a full screen long, or as short as you



like, with more than one field allowed on each line. Need extra room? No problem—each record can run on for 32 pages, with up to 100 fields per page. And, if you want to make changes in your form, you can always redo it, even after you've entered information.

The program is ideal for organizing blocks of text, such as notes for a report or even a book. Unlike many data bases, *Professional File* lets you include a screenful of data in a single field. It will also sort records into lists by keyword, making it simple to organize notes. The printing functions are particularly good at handling text, or reports can be transferred to your word processor for editing and rewriting.

When working with numbers, you can create calculated fields that combine data from several other fields according to the mathematical formula you enter (using only addition, subtraction, multiplication, and division). A significant limitation here is that all the referenced fields must be on the same page of your on-screen form. When you're ready to prepare reports, you can use totals and subtotals, item counts, averages, and minimum and maximum values, and you can divide data into numeric ranges.

Professional File also includes a useful macro capability for replaying lengthy keystroke sequences automatically. It boasts good documentation and excellent context-sensitive help screens.

With its combination of flexibility, power, and ease of use, this program is highly recommended for handling statistical data and especially for managing text-heavy information.

—STEVE MORGENSTERN

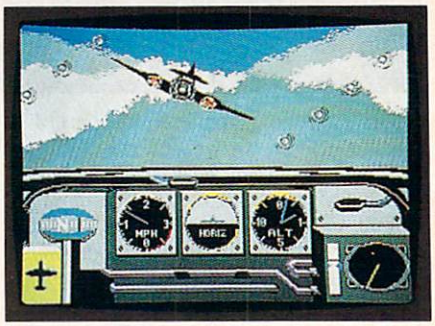
ENTERTAINMENT

Ace of Aces

HARDWARE REQUIREMENTS: C 64/128.
PUBLISHER: Accolade
PRICE: $30
REVIEWER'S SUGGESTED AGES: 8+

An air traffic controller couldn't keep track of all the aerial combat simulators on the market, but this one has a feature that makes it easy to spot. After mastering each of four arcade-style missions, experienced pilots can mix them in any combination. Veterans can even tackle all four in a single outing.

You begin by choosing one mission—knocking out Nazi bombers, V-1 rockets, a train, or submarines—and an appropriate arsenal of rockets, bombs, and cannon ammo. Then you climb into the cockpit of a Mosquito, a British fighter bomber. With only a few dials and gauges to scrutinize, anyone can master in



minutes the basics of flying the Mosquito. You press a key or use the joystick to switch between the forward perspective and views to the left and right sides. Also, there are screens that depict the bomb bay and a mission map with the current position of enemy targets and your plane flying over Europe.

In the air, you'll witness fast, smooth animation as enemy fighters materialize through layers of rolling clouds. Sound effects and special visual transitions between game phases dramatize the action. But it's not all eye/hand coordination, for success involves making correct decisions on your flight path, speed, altitude, and other realistic factors. At least you don't have to negotiate the most demanding part of flying (takeoffs and landings), because after loading up with weapons, the entire game takes place in the air.

—SHAY ADDAMS

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SOFTWARE REVIEWS

World Games

HARDWARE REQUIREMENTS: Amiga, Apple, Atari ST, C 64/128, IBM PC/PC*jr*.
PUBLISHER: Epyx, Inc.
PRICE: $30-$40
REVIEWER'S SUGGESTED AGES: 8+

Six of the eight events in this collection are truly exotic: Acapulco cliff-diving, the Scottish caber toss, bull-riding in the U.S., Japanese sumo wrestling, barrel jumping on ice skates in Germany, and Canadian log rolling. The others, slalom skiing and weight-lifting, have been seen in earlier computer games.

After choosing a country to represent, you compete in one or more events. A single-screen travelogue (which can be turned off) describes each sport. Then your animated character takes the stage in a stadium or other appropriate setting. You can control the difficulty level in each sport, such as the height at which you dive off the cliff. Visual indicators, such as bar graphs, appear in windows to provide pertinent information such as wind direction and speed.

An athlete's animated reactions depend on the outcome of the event. For example, a successful diver waves and smiles. But after a bad dive, he wipes his brow nervously. If you've beaten an existing record, your name and the new record will be saved to disk. Gold, silver, and bronze medals are awarded to the players with the highest cumulative scores, and current world records may be examined from the main menu.

Some events focus on timing, others on eye/hand coordination, but most require a combination of skills. Mood-setting melodies and sound effects enhance the sense of "being there," and the national anthem plays when you choose your country. Unfortunately, the anthems cannot be turned off, and they grow tedious after a few sessions. Otherwise, the crisp graphics and variety of sports put *World Games* in the winner's circle.

—SHAY ADDAMS

Amnesia

HARDWARE REQUIREMENTS: 64K Apple.
PUBLISHER: Electronic Arts
PRICE: $45
REVIEWER'S SUGGESTED AGES: 12+

I never thought I'd be washing windshields and panhandling for a living, but then I never expected to wake up in a New York City hotel and not even remember my name, either. That's what happened when I entered this absorbing text adventure in which the central puzzle is recovering your identity. Some people you meet will call you Xavier Hollings and others know you as John Cameron, but you're a dead man by any name unless you find out who framed you.

The search for clues unfolds in over 4,000 locations. Most of them are Manhattan street corners, and the entire New York City subway system is also programmed into the game. So are many of the Big Apple's tourist attractions, such as St. Patrick's Cathedral and Washington Square. Besides solving an assortment of object- and character-related problems, you must earn money and find a place to sleep. Otherwise you will pass out from exhaustion and come to in a hospital where the police nail you for murdering someone during a Texas jailbreak.

Amnesia's parser understands complete sentences and an extensive vocabulary of nouns, verbs, adjectives, and other parts of speech, smoothing the way for commands like "get the Gideon Bible and put it on the television." The two-disk package contains maps of the streets and subways, which eliminates the dreariest part of most adventures—drawing maps. The scoring system is unique, awarding points in three categories: detective, character, and survivor.

Rather than adapting one of his existing science-fiction or mystery novels, noted author Thomas M. Disch wrote *Amnesia* specifically for this medium. The result is interactive fiction's most literate and dramatic work to date. At times his prose spills vividly across several consecutive screens. The result is an adventure that's as compelling to read as it is challenging to solve.

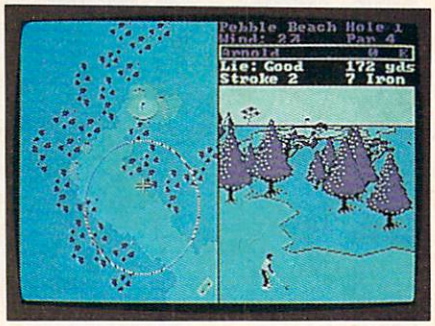
—SHAY ADDAMS

World Tour Golf

HARDWARE REQUIREMENTS: 256K IBM PC.
PUBLISHER: Electronic Arts
PRICE: $50
REVIEWER'S SUGGESTED AGES: 10+

While golf may not be America's favorite sport, the proliferation of golfing programs suggests its popularity is not restricted to executives or weekend television. The features found in *World Tour Golf*, which surpass every similar program to date, are a golfer's dreams come true.

From one to four gamers (with or without robot opponents) have the opportunity to play on a score of world-famous courses, each recreated in high-res detailed graphics. Using a complex and sophisticated ball-hitting system, each shot is calculated according to speed and angle of swing, strength, club-head angle, wind strength and direction, accuracy of aim, and terrain features. (Players can also opt for an easy one-key method.) The course hazards—sand traps, trees, the rough, water hazards, and others—play a major role in each game.



Each player chooses a golfer as an on-screen stand-in (just as in a role-playing adventure), and the stats for each character can be adjusted for play balance between duffers and those with low handicaps. This is just the beginning, though, for *World Tour Golf* also offers a great golf-course construction set.

You can make such simple changes to existing courses as re-arranging the order of holes. Then go on to make minor adjustments in a single hole or an entire course, or go all the way and design your own holes or complete courses from scratch. Imagine a 2,000-yard hole with 20 water hazards! The sky's the limit here, and with this easy-to-use design system, the work is as much fun as, and even more varied than, *Pinball Construction Set*.

—JAMES DELSON

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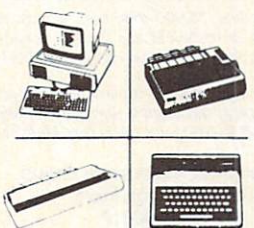

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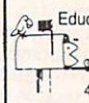
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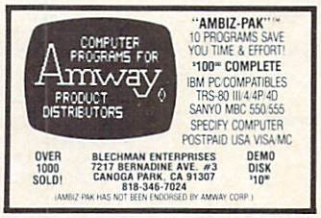

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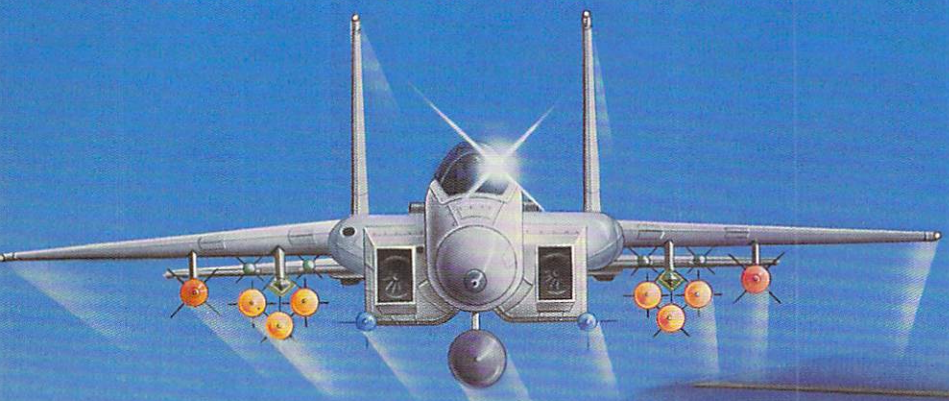

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